Vol. 1008 Number 1

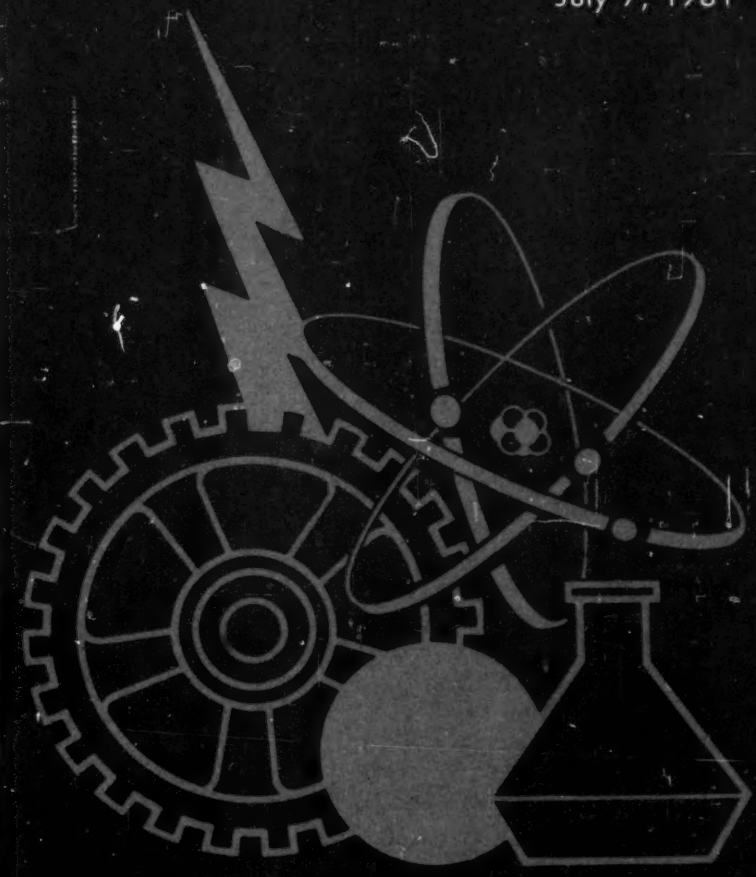
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 7, 1981



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 7, 1981 Volume 1008 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1008 OG 2
Availability of Patent and Trademark Office Notices on a Subscription Basis	1008 OG 2
Reissue Applications Filed	1008 OG 2
Patent Certificates of Correction	1008 OG 3
National Technical Information Service	1008 OG 3
Reference Collections of U.S. Patents	1008 OG 5
Condition of Patent Applications	1008 OG 6
Defensive Patent Publications (100,801)	1
Reissue Patents Granted (30,664)	3
Patents Granted	
General and Mechanical (4,276,657)	7
Chemical (4,277,242)	209
Electrical (4,277,638)	321
Design Patents Granted (259,745)	393
Index of Patentees	PI 1
Indices of Reissue, and Design Patentees	PI 41
Index of Applicants of Defensive Publications	PI 43
Classification of	
Patents (Including Reissues)	PI 45
Designs and Defensive Publications	PI 47
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 48
Designs and Applicants of Defensive Publications	PI 49
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90-95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Availability of Patent and Trademark Office Notices on a Subscription Basis

Effective Mar. 3, 1981, a separate publication of a part of the *Official Gazette* entitled *Patent and Trademark Office Notices* is being made available on a subscription basis. This weekly periodical contains all notices which appear in the Patent *Official Gazette* and the Trademark *Official Gazette.* Additionally, current information regarding the general date status of trademark and patent applications will be provided.

Depending on the postage rate that is preferred, the subscription price for this service is as follows:

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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,714,513, Re. S.N. 251,025, Filed Apr. 3, 1981, Cl. 361/415, PRINTED CIRCUIT CARD RETAINER AND RACK ASSEMBLY, Joseph Marconi, Owner of Record: *Inventor,* Attorney or Agent: Charles L. Gholz, Ex. Gp.: 217

4,148,557, Re. S.N. 251,592, Filed Apr. 6, 1981, Cl. 350/96.20, ADJUSTABLE FIBER OPTIC CONNECTOR, Steven E. Garvey, Owner of Record: *Hewlett-Packard Co., Palo Alto, Calif.,* Attorney or Agent: Ronald E. Grubman, Ex. Gp.: 257

4,169,770, Re. S.N. 250,891, Filed Mar. 30, 1981, Cl. 204/28, ELECTROPLATING ALUMINUM ARTICLES, William Ernest Cooke, et al., Owner of Record: *Alcan Research and Development Ltd., Montreal, Quebec, Canada,* Attorney or Agent: Robert S. Dunham, et al., Ex. Gp.: 114

4,171,206, Re. S.N. 248,774, Filed Mar. 30, 1981, Cl. 55/26, SEPARATION OF MULTICOMPONENT GAS MIXTURES, Shivaji Sircar, Owner of Record: *Air Products and Chemicals, Inc., Allentown, Pa.,* Attorney or Agent: E. Eugene Innis, et al., Ex. Gp.: 176

4,236,061, Re. S.N. 252,400, Filed Apr. 9, 1981, Cl. 219/265, QUICK-ACTING ELECTRIC CIGAR LIGHTER, Lawrence E. Fenn, et al., Owner of Record: *Inventor,* Attorney or Agent: H. Gibner Lehmann, Ex. Gp.: 213

4,242,445, Re. S.N. 248,502, Filed Mar. 27, 1981, Cl. 430/569, METHOD FOR PREPARING LIGHT-SENSITIVE SILVER HALIDE GRAINS, Mitsuo Saito, Owner of Record: *Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 166

PATENT NOTICES

Certificates of Correction for the Week of July 7, 1981

Plt. 4,673	4,222,780	4,251,708	4,257,409
Re. 30,199	4,230,175	4,251,716	4,257,582
Re. 30,511	4,230,875	4,251,836	4,257,866
D. 258,517	4,231,943	4,252,292	4,258,811
3,893,127	4,232,251	4,252,686	4,259,467
3,911,089	4,234,030	4,252,988	4,259,639
3,979,732	4,234,468	4,253,073	4,259,922
3,993,777	4,235,304	4,253,393	4,259,973
4,033,949	4,235,548	4,253,580	4,260,542
4,047,102	4,235,668	4,253,607	4,260,545
4,131,051	4,236,116	4,253,806	4,260,921
4,135,329	4,237,253	4,253,814	4,261,286
4,137,585	4,237,405	4,253,822	4,261,378
4,159,906	4,238,706	4,253,918	4,261,436
4,162,909	4,239,657	4,254,009	4,261,451
4,165,235	4,240,881	4,254,087	4,261,509
4,166,485	4,241,099	4,254,211	4,261,569
4,175,048	4,244,133	4,254,335	4,261,654
4,188,269	4,245,899	4,255,129	4,261,670
4,188,897	4,246,536	4,255,294	4,261,704
4,189,174	4,246,792	4,255,527	4,261,714
4,191,444	4,246,843	4,255,537	4,261,718
4,205,785	4,247,044	4,255,706	4,261,828
4,207,612	4,247,307	4,256,045	4,261,862
4,214,102	4,248,941	4,256,621	4,262,170
4,220,570	4,249,342	4,256,723	4,263,487
4,220,583	4,250,136	4,256,730	4,263,965
4,221,986			

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP
1900 Half St., S.W.
Washington, D.C. 20324

Patent application 6-206,412. Argon Purity Tester. Filed Nov. 13, 1980.

Patent application 6-212,955. Load Balancer for Multiple Loads. Filed Dec. 4, 1980.

Patent 4,244,212. Fluidic Pressure Ratio Sensor. Filed May 25, 1979. Patented Jan. 13, 1981. Not available NTIS.

Patent 4,244,271. Ammunition Feed Timing Mechanism. Filed Jan. 10, 1979. Patented Jan. 13, 1981. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch
Administrative Service Division Federal Building
Science & Education Administration
Hyattsville, Md. 20782

Patent 4,249,655. Cyclone Dust Analyzer for Determining Microdust Content in Fibers. Filed June 29, 1979. Patented Feb. 10, 1981. Not available NTIS.

Patent 4,253,215. Lint Cleaning Apparatus for Automatic Control of Cotton Quality. Filed Feb. 23, 1979. Patented Mar. 3, 1981. Not available NTIS.

Patent 4,253,841. Process for Photoinitiated, Polymeric Encapsulation of Cotton Fibers in Durable-Press Textiles. Filed Feb. 23, 1979. Patented Mar. 3, 1981. Not available NTIS.

Patent 4,254,005. Abrasion Resistance and Strength of Cotton-Containing Fabric Made Resilient with N-Methylolacrylamide-Type Reagent. Filed Feb. 6, 1980. Patented Mar. 3, 1981. Not available NTIS.

Patent 4,254,022. Protein in Concentrate from High-Protein Pearl Millet. Filed Mar. 21, 1980. Patented Mar. 3, 1981. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
Chief, Patent Branch
Westwood Building
Bethesda, Md. 20205

Patent application 6-163,521. Bisulfite Stabilization of 5-Azacytidine. Filed June 27, 1980.

Patent 4,252,800. 7(alpha)-Methylnorethindrone Enanthate and Its Use in Long Term Suppression of Fertility in Female Mammals. Filed Oct. 5, 1979. Patented Feb. 24, 1981. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents
18th and C Streets, N.W.
Washington, D.C. 20240

Patent application 6-168,815. Machine for Mixing and Injecting Water and Grout Into a Roof Bolt Hole. Filed July 10, 1980.

Patent application 6-168,816. Preflush-Lixiviant Process for Solution Mining of Uranium Ore Beds. Filed July 10, 1980.

Patent application 6-168,822. A Process of Electroplating a Platinum-Rhodium Alloy Coating. Filed July 10, 1980.

Patent application 6-168,823. Readout Circuit for Linear Displacement Transducer. Filed July 10, 1980.

Patent application 6-184,852. Sputtering Apparatus for Coating Elongated Tubes and Strips. Filed Sept. 8, 1980.

Patent application 6-195,539. Instrumentation for Surveying Underground Cavities. Filed Oct. 9, 1980.

Patent application 6-197,864. Production of Ferrochromium Alloys. Filed Oct. 17, 1980.

Patent application 6-200,109. Production of Metal Powder. Filed Oct. 24, 1980.

Patent application 6-200,111. Regeneration of Waste Metallurgical Process Liquor. Filed Oct. 24, 1980.

Patent application 6-206,246. Amine Flotation of Chromite from Acidic Pulps. Filed Dec. 12, 1980.

Patent application 6-206,247. Continuous Transducer Drift Compensator. Filed Nov. 12, 1980.

Patent 4,221,827. Method of Manufacturing a Gas Sensor. Filed Dec. 19, 1978. Patented Sept. 9, 1980. Not available NTIS.

Patent 4,222,611. In-situ Leach Mining Method Using Branched Single Well for Input and Output. Filed Aug. 16, 1979. Patented Sept. 16, 1980. Not available NTIS.

Patent 4,231,859. Molybdenite Flotation. Filed Nov. 27, 1979. Patented Nov. 4, 1980. Not available NTIS.

Patent 4,231,993. Recovery of Metal Values from Lead Smelter Matte. Filed June 11, 1979. Patented Nov. 4, 1980. Not available NTIS.

Patent 4,235,163. Mine Face Ventilation System. Filed July 6, 1979. Patented Nov. 25, 1980. Not available NTIS.

Patent 4,239,735. Removal of Impurities from Clay. Filed Sept. 6, 1979. Patented Dec. 16, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Director, Navy Patent Program/
Patent Counsel for the Navy
Office of Naval Research
Code 302
Arlington, Va. 22217

Patent application 6-176,151. Improved Droop Stop for Fully Articulated Rotor. Filed Aug. 7, 1980.

Patent application 6-188,654. Safety Selector Switch. Filed Sept. 19, 1980.

Patent application 6-191,599. Phase Controlled Shuttering System with Selectable Shuttered and Unshuttered Modes. Filed Sept. 29, 1980.

Patent application 6-216,400. Safing and Arming Mechanism. Filed Dec. 15, 1980.

Patent application 6-219,463. Low Drag Underwaer Vehicle Utilizing Boundary Layer Suction. Filed Dec. 23, 1980.

Patent application 6-222,113. Simple Method for Fabricating Multimode Fiber Optic Access Couplers. Filed Jan. 2, 1981.

Patent application 6-227,568. Wide Band Data Processing Technique. Filed Jan. 22, 1980.

Patent 4,234,044. Chemical Agent Injection System for Fire Fighting Equipment. Filed Sept. 27, 1978. Patented Nov. 18, 1980. Not available NTIS.

Patent 4,234,046. Pressure Differential Seafloor Corer-Carrier. Filed Apr. 30, 1979. Patented Nov. 18, 1980. Not available NTIS.

Patent 4,234,712. Polyphthalocyannine Resins. Filed Sept. 14, 1979. Patented Nov. 18, 1980. Not available NTIS.

Patent 4,236,401. Frequency Response Tester. Filed May 24, 1979. Patented Dec. 2, 1980. Not available NTIS.

Patent 4,237,461. High-Speed Digital Pulse Compressor. Filed Feb. 15, 1979. Patented Dec. 2, 1980. Not available NTIS.

Patent 4,238,856. Fiber-Optic Acoustic Sensor. Filed Jan. 24, 1979. Patented Dec. 9, 1980. Not available NTIS.

Patent 4,244,386. Value Having Pyrotechnic Separation Device. Filed Jan. 30, 1979. Patented Jan. 13, 1981. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 16, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-07-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	2-05-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	1-07-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-03-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-28-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-13-79
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-17-79
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-14-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-28-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	3-26-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	11-06-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	9-13-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	6-22-79

Expiration of patents: The patents within the range of numbers indicated below expire during May 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,131,397 to 3,134,980, inclusive

Plant Patents ..... Numbers 2,399 to 2,406, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JULY 7, 1981

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T100,801
ENERGY-ABSORBING DEVICE AND METHOD FOR MAKING SAME

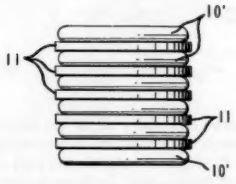
Dominick Bianca, 2618 W. Robino Dr., Wilmington, Del. 19808

Continuation of Ser. No. 4,483, Jan. 18, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 190,960

Int. Cl.³ B29H *3/00*; F16F *1/40, 1/44*

U.S. Cl. 267—141.1

2 Sheets Drawing. 16 Pages Specification



An energy-absorbing device comprising a permanently shortened member of a thermoplastic elastomer wherein said member comprises circumferentially enlarged portions due to permanent shortening by compression of an elongated member along its longitudinal axis of at least 10% of its original length, the enlarged portions being at least partially oriented and at least one unenlarged portion, and rigid retaining means encircling said unenlarged portion of the shortened thermoplastic elastomer member.

T100,802
COMPOSITE PIPE FITTINGS AND THE PRODUCTION THEREOF

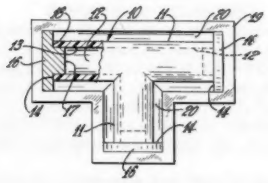
Richard L. Vockel, Jr., 151 Highgate St., Granville, Ohio 43023

Continuation of Ser. No. 973,824, Dec. 27, 1978, abandoned. This application May 22, 1980, Ser. No. 152,278

Int. Cl.³ F16L *41/00*

U.S. Cl. 285—156

1 Sheets Drawing. 12 Pages Specification



A composite pipe fitting and a method for producing it are provided by encasing a thermoplastic pipe fitting in a thermosetting material reinforced with discrete fibers with an adhesive material intermediate the thermoplastic pipe fitting and thermosetting material bonding the thermoplastic pipe fitting to the thermosetting material.

T100,803
LATCH FOR BATTERY COVERS

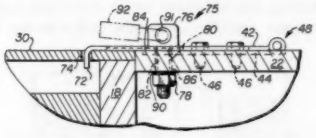
David L. Morrow, 1148 Plainfield Rd., South Euclid, Cuyahoga County, Ohio 44121

Filed Jul. 5, 1979, Ser. No. 55,112

Int. Cl.³ E05C *19/08*

U.S. Cl. 292—285

2 Sheets Drawing. 11 Pages Specification



A latch assembly (**32**) is disclosed for use with a compartment (**10**) of the type having a cover structure (**24**) removable therefrom, and a wall end portion (**22**). The latch assembly (**32**) comprises a strap (**34**) with finger members (**56,58**) receivable into apertures (**52,54**) of the cover structure. The strap is pivotally connected to the wall end portion and may be raised from and lowered into the apertures. The strap has a slot (**62**), defining a first surface, which is transverse to a recess (**60**), defining a second surface. A keeper (**75**) is positionable into contact and out of contact with the second surface. When the keeper is positioned out of contact with the second surface, the strap may be raised and the cover structure removed; when the keeper is in contact with the second surface, the latch assembly restrains movements in all directions which would act to displace the cover structure from its covering position. The principal use of the latch assembly is for securing a pair of battery cover members (**28,30**) to the battery compartment (**10**) of an electrically driven vehicle.

T100,804
MICROPROCESSOR CONTROLLED POWER SUPPLY FOR XEROGRAPHIC FUSING APPARATUS

Larry M. Ernst, 5000 Butte #35, Boulder, Colo. 80301

Continuation of Ser. No. 921,659, Jul. 3, 1978, abandoned. This application Jan. 7, 1980, Ser. No. 110,262

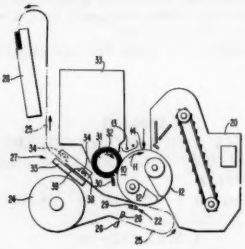
Int. Cl.³ G03G *15/00*

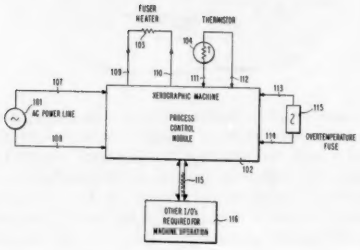
U.S. Cl. 355—14 FU

9 Sheets Drawing. 49 Pages Specification

In a xerographic machine having control apparatus for regulating the temperature of a toner fusing device, said control apparatus comprising: a toner fusing device having electrical heater means for elevating the temperature of at least a portion of said fusing device; first means responsive to the temperature of said fusing device for providing an electrical manifestation indicative of the temperature of said fusing device; a controllable source of electrical energy for providing a controllable number of increments of electrical energy per unit of elapsed time to said heater means of said fusing device; and microprocessor means interconnecting said first means and said controllable source of electrical energy, whereby said micro-

processor means in response to the electrical manifestation indicative of the temperature of said fusing device controls the





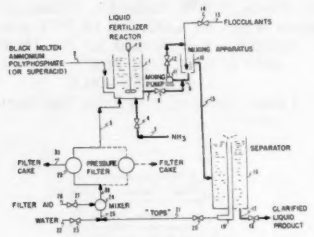
number of increments of electrical energy provided to said heater means during each unit of elapsed time.

T100,805

CLARIFICATION OF BLACK AMMONIUM POLYPHOSPHATE LIQUIDS RECYCLING OF BYPRODUCT TOPS

Horace C. Mann, Jr., Box 345, Rte. 4, Killen, Ala. 35645, and Kenneth E. McGill, Rte. 1, Box 163, Virginia Shores, Sheffield, Ala. 35660

Filed Oct. 6, 1980, Ser. No. 194,304
Int. Cl.[3] C05B 7/00
U.S. Cl. 71—34
1 Sheets Drawing. 30 Pages Specification



The process allows essentially all of the nitrogen and P_2O_5 values in the treated black ammonium polyphosphate liquid to be recovered in the form of valuable clarified product. In the process, a heel of black liquid fertilizer is first clarified by a prior-art procedure using flocculants. The improvement over the prior art picks up with the byproduct tops which is then diluted with the water of formulation required to dissolve additional amounts of ammonium polyphosphate melt. This diluted liquid is filtered, the filter cake containing upwards of 99 percent of the undesirable black carbonaceous material is discarded, and the clear filtrate, which contains essentially all of the nitrogen and P_2O_5 originally in the tops, is then used in lieu of the prior-art water of formulation to dissolve additional ammonium polyphosphate melt to produce more black ammonium polyphosphate liquid.

REISSUES

JULY 7, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

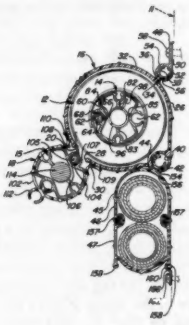
Re. 30,664
RETRACTABLE AWNING

Albert E. Upton, Wichita, Kans., and Donald S. McKee, Louisville, Colo., assignors to The Scott & Fetzer Company, Lakewood, Ohio

Original No. 4,020,888, dated May 3, 1977, Ser. No. 697,777, Jun. 21, 1976. Application for reissue Mar. 26, 1979, Ser. No. 23,837

Int. Cl.³ E04F *10/06*

U.S. Cl. 160—66 **3 Claims**



1. A retractable awning adapted to be attached to a supporting surface and being movable between extended and retracted positions comprising in combination:

a roll bar,

a sheet of awning material anchored along an inner edge to said roll bar and adapted to be wound about the roll bar when the awning is retracted,

a case rotatably supporting the roll bar therewithin,

a mounting rail securable to said supporting surface, said mounting rail and case including connecting elements defining means for a releasable tongue-in-groove connection between the case and the mounting rail,

a lead bar connected to an outer edge of said sheet of awning material,

brace members selectively positionable between the [roll] *lead* bar and said supporting surface to hold the awning in the extended position, and

an auxiliary case adapted to store said brace members, and tongue-in-groove connection means connecting said auxiliary case to the first mentioned case.

Re. 30,665
BINOCULAR TELESCOPE

Erwin Altenheiner, Hasselborn; Volker Donn, Heidenheim; Joachim Hornschu; Walter Jachan, both of Oberkochen, and Artur Jung, Heidenheim, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

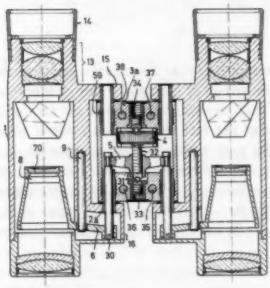
Original No. 4,080,043, dated Mar. 21, 1978, Ser. No. 620,391, Oct. 7, 1975. Continuation of Ser. No. 376,896, Jul. 5, 1973, abandoned. Application for reissue Apr. 3, 1979, Ser. No. 26,686

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1973, 2316955

Int. Cl.³ G02B *7/06*

U.S. Cl. 350—76 **26 Claims**

1. A binocular telescope comprising two separate individual telescope housings with interior movable-lens mounts and elements for individual telescope systems, a bridge housing between said telescope housings and having separate spaced parallel hinged connections to each of the respective telescope housings, said hinged connections establishing an axially located relation of said bridge and telescope housings, the hinge axes being parallel to the telescope axes, each telescope housing and the associated movable-lens mount including two spaced parallel coacting elongate guide means so related as to assure (a) optical-axis alignment of the movable-lens element for all longitudinally adjusted positions thereof and (b) nonrotation of said movable-lens element with respect to the associated telescope housing, whereby articulation of either or both of the respective housings necessarily articulates the movable-lens elements associated therewith in exact correspondence regardless of the longitudinally guided positioning of said movable-lens elements, a bridge element contained



within said bridge housing and extending between the axes of said hinge connections and including means having longitudinally guided relation to each of said hinge axes, selectively operable externally accessible adjustment means carried by said bridge housing and internally connected to said bridge element for adjusting the longitudinal position of said bridge element, whereby said bridge element may be longitudinally displaced regardless of the pivoted relation of said housings over a range of interocular adjustment of the spacing of telescope axes, and housing-contained lens-positioning means connecting each said movable-lens mount to said bridge element via that one of the hinge-connection axes which applies to the particular housing whereby there will be longitudinally coordinated positioning of said bridge element with respect to the movable-lens mount of each of said telescope systems.

Re. 30,666
AUDIO VISUAL INFORMATION SYSTEM

James A. H. Mitchell, London, and Edward J. Day, Kingston Surry, both of England, assignors to Mitchell Beazley Encyclopedias, Ltd., London, England

Original No. 4,124,943, dated Nov. 14, 1978, Ser. No. 616,551, Sep. 25, 1975. Application for reissue Aug. 27, 1979, Ser. No. 69,830

Int. Cl.³ G09B *5/06*

U.S. Cl. 434—307 **26 Claims**

25. An audio visual information system comprising:

a. first information means comprising pictorial information concerning a particular selected topic;

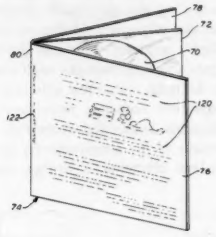
b. second information means comprising first text information means comprising pages of illustrated text and word descriptions relating to said selected topic, and second text information means comprising comprehensive sub topic information

covering said topic and reference to pages of the illustrated text and said descriptions;

c. recording means comprising a recording for audio visual playback including audio visual display of said pictorial and text information; wherein

d. part of said pictorial information being recorded upon said recording means for continuous viewing;

e. said first and second text information means being recorded upon said recording means for frame by frame viewing; and



f. said first and second text information being recorded on said recording means on at least one frame so that in a continuous viewing of said pictorial information the lack of many multiple frames of the text information inhibits viewing thereof, whereby the user may stop the continuous viewing of the topical pictorial information to study the first text information means relative to the topical information and then selectively study the comprehensive sub topic informtion with reference to related sections of said illustrated text.

Re. 30,667

POLY-DICARBON MONOFLUORIDE

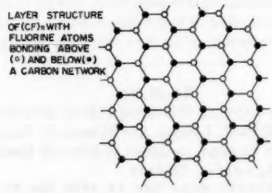
Nobuatsu Watanabe, No. 136, Uguisu-dai, Nagaokakyo-shi, Kyoto, Japan, and Yasushi Kita, Hiroshima, Japan, assignors to Nobuatsu Watanabe and Applied Science Research Institute, both of Kyoto, Japan

Original No. 4,139,474, dated Feb. 13, 1979, Ser. No. 824,911, Aug. 15, 1977. Application for reissue Jul. 6, 1979, Ser. No. 55,358

Claims priority, application Japan, Feb. 22, 1977, 52-017823

Int. Cl.³ C09K *3/00*; C07C *19/08*

U.S. Cl. 252—1 **5 Claims**



1. A chemical compound poly-dicarbon monofluoride represented by the formula

$$(C_2F)_n$$

and having a crystalline structure in which a layer structure [as shown in FIG. 12 hereof] is stacked with an interlayer spacing of about 9.0 A to form a packing structure, *said crystalline structure exhibiting a peak at about 10° in terms of an angle of 2θ in the X-ray diffraction powder pattern.*

Re. 30,668

PROCESS FOR PREPARING MATERIALS HAVING IMPROVED MECHANICAL AND THERMAL PROPERTIES AND MATERIALS OBTAINED THEREBY

Franco Buonomo; Vittorio Fattore, and Bruno Notari, all of S. Donato Milanese, Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Original No. 4,013,590, dated Mar. 22, 1977, Ser. No. 519,792, Oct. 31, 1974. Application for reissue Mar. 12, 1979, Ser. No. 19,574

Claims priority, application Italy, Oct. 31, 1973, 30787/73

Int. Cl.³ B01J *21/12*

U.S. Cl. 252—455 R **10 Claims**

1. The process of improving the mechanical and thermal properties of aluminum oxide adapted for use as a catalyst or catalyst carrier which comprises impregnating said aluminum oxide with a silicon compound having the general formula:

in which X, Y, Z and W are selected from the group consisting of (—R), (—Cl), (—Br), (—SiH), (—COOR), (—SiH*n*Cl*m*), —[OSi(OR)]p, OSi, $(OR)_3$, in which R is an alkyl, cycloalkyl, aromatic, alkylaromatic or alkyl-cycloalkyl radical having from 1 to 30 carbon atoms; n, m and p are whole numbers from 1 to 3, by bringing said silicon compound or a solution thereof in a compatible organic solvent whose boiling point is lower than the boiling point of the silicon compound into contact with said aluminum oxide, drying said impregnated aluminum oxide at a temperature in the range of from the boiling point of the silicon compound to 500° C., and then subjecting said impregnated aluminum oxide to controlled oxidation.

Re. 30,669

MICROBIAL RENNIN

Louis Feldman, Spring Valley, N.Y., assignor to Gist-Brocades N.V., Delft, Netherlands

Original No. 4,136,201, dated Jan. 23, 1979, Ser. No. 860,636, Dec. 14, 1977. Continuation of Ser. No. 688,349, Dec. 6, 1967, abandoned, which is a continuation-in-part of Ser. No. 631,608, Apr. 18, 1967, abandoned. Application for reissue Oct. 15, 1979, Ser. No. 85,069

Int. Cl.³ C12N *9/58*; A23C *19/02*

U.S. Cl. 426—36 **8 Claims**

1. A microbial rennin having relatively high milk coagulating activity and relatively low proteolytic activity and being [relatively] *substantially* free from lipase obtained by cultivating a selected strain of Mucor miehei [(NRRL No's: 3169, A7772, A13131, A13042, and 2543)] *capable of producing microbial rennin* in a medium containing available carbon, nitrogen and trace nutrients and fermenting under aerobic conditions.

Re. 30,670

DRY PLANOGRAPHIC PRINTING PLATE

Yuh Ezumi, Kyoto; Masaharu Kobayashi, Otsu; Takashi Kubota, Kamakura, and Yoichi Shimokawa, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Original No. 4,086,093, dated Apr. 25, 1978, Ser. No. 713,576, Aug. 11, 1976. Continuation of Ser. No. 514,063, Oct. 11, 1974, abandoned. Application for reissue Jul. 16, 1979, Ser. No. 57,753

Claims priority, application Japan, Oct. 17, 1973, 48-115728

Int. Cl.³ G03C *1/68, 1/84*

U.S. Cl. 430—281 **14 Claims**

1. A negative acting presensitized dry planographic printing [place] *plate* comprising:

(a) a flexible base layer,

(b) a sparsely cross-linked linear diorganopolysiloxane layer overlying said base layer, and

(c) a photoadhesive layer overlying said diorganopolysiloxane layer, and in direct contact therewith comprising at least one photopolymerizable unsaturated compound having a boiling point above 100° C. and a photoinitiator wherein at least one said photopolymerizable compound has at least one hydroxyl group and at least one acryloyl group or one methacryloyl group in the same molecule and the total concentration of the hydroxyl groups and the total concentration of the acryloyl [or] *and* methacryloyl groups in the photoadhesive layer are each greater than 0.1 mmol/g.

Re. 30,671

MICROPROCESSOR SYSTEM HAVING HIGH ORDER CAPABILITY

Sydney W. Poland, Arlington, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original No. 4,153,937, dated May 8, 1979, Ser. No. 783,903, Apr. 1, 1977. Continuation-in-part of Ser. No. 714,464, Aug. 16, 1976. Application for reissue Jul. 9, 1979, Ser. No. 55,888

Int. Cl.[3] **G06F** *3/08, 15/02*

U.S. Cl. 364—706 **36 Claims**

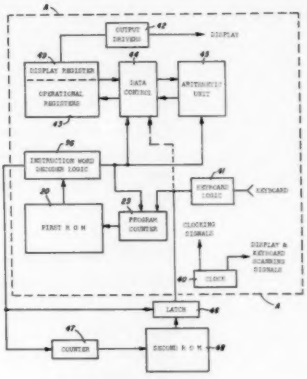
1. In an electronic microprocessor system, having a keyboard, output means for outputting data, a data memory for storing data, an arithmetic unit for performing arithmetic operations on the data stored in said data memory, and a first non-volatile memory for storing groups of instruction words for controlling the arithmetic operations performed by said arithmetic unit, the combination which comprises:

(a) a second non-volatile memory for storing a plurality of sets of program codes, each program code being effective for addressing a preselected group of instruction words stored in first non-volatile memory, said second non-volatile memory being disposed in a module having a plurality of electrical contacts;

(b) a receptacle for temporarily interconnecting the contacts on said module with said microprocessor system;

(c) keyboard logic means for decoding inputs received at said keyboard;

(d) means for addressing said second non-volatile memory to read out preselected sets of program codes, said means for addressing said second memory including a counter responsive to selected instructions outputted from said first memory;



(e) means for addressing said first non-volatile memory in response to the program codes read out of said second non-volatile memory, said means for addressing said first memory including a first program counter selectively responsive to said keyboard logic means and said program codes outputted from said second memory.

PATENTS

GRANTED JUL. 7, 1981

ERRATA

For CLASS	See PATENT NO.
434–047	4,276,702
411–041	4,276,806
493–287	4,276,815
294–145	4,277,006
493–433	4,277,058
369–248	4,277,070
369–084	4,277,071
023–293 R	4,277,331
422–120	4,277,361
518–703	4,277,416
560–024	4,277,420
570–185	4,277,421
338–308	4,277,542

PATENTS

GRANTED JULY 7, 1981

GENERAL AND MECHANICAL

4,276,657

ACCESSORY TO HARD HAT ATTACHING MEANS

Edward M. Montesi, Barrington, R.I., assignor to Norton Company, Worcester, Mass.

Filed Feb. 25, 1980, Ser. No. 124,119

Int. Cl.³ A44B *21/00*; A61F *9/02*

U.S. Cl. 2—422 **12 Claims**

12. A protective unit including a safety hard hat having a crown portion extending to a lower rim, an accessory engageable in an inoperative rest position with the crown and an accessory band attached to and extending rearwardly from the accessory for connection to the lower rim of the hard hat, wherein the improvement comprises:

a plurality of clips angularly spaced along and attached to the lower rim for attaching and retaining the accessory band thereto and each clip having

a substantially rigid stationary portion extending from an entrance end portion thereof and adapted to frictionally engage a surface portion of the lower rim wall,

a moveable resilient clamping portion situated opposite the stationary portion and which is adapted to engage an opposite surface portion of the lower rim wall, move outwardly, flex and produce a resilient clamping force against a portion of the lower rim wall insertable in between the stationary and moveable resilient portions when the clip is attached to the rim of the hard hat,

a curved slot including an entrance expandable between the stationary and moveable resilient clamping portions for receiving a portion of the lower rim wall, and

a passage extending through the clip adjacent the rigid stationary portion and spaced from the slot and adapted for receiving and retaining the accessory band to the clip.

4,276,658

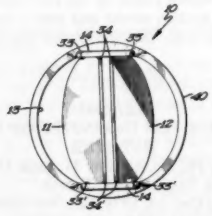
HEART VALVE PROSTHESIS

Donald W. Hanson, and William E. Palmquist, both of Northfield, Minn., assignors to St. Jude Medical, Inc., St. Paul, Minn.

Continuation of Ser. No. 847,780, Nov. 2, 1977, abandoned. This application Feb. 7, 1980, Ser. No. 119,528

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **16 Claims**



1. In a heart valve prosthesis of the type having base means including a blood passageway, means for regulating the flow of blood through the passageway and means for maintaining the regulating means in operative relation to the passageway, the improvement wherein said maintaining means comprises:

(a) recess means within said base means, said recess means having a concave bearing surface formed as a substantially continuous surface of revolution; and

(b) said regulating means comprising at least one leaflet having means projecting from the edge thereof and into said recess means, said projecting means being formed as a surface of revolution means about an axis normal to the plane of said leaflet and compatible with said concave bearing surface for forcibly flushing blood from said recess means upon operative movement of the projecting means of said leaflet within said recess means.

4,276,659

MEDULLARY CANAL PLUG

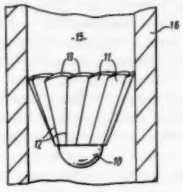
Kevin Hardinge, 'Thornfield ' Legh Rd., Knutsford, Cheshire WA12 8LS., England

Filed Nov. 19, 1979, Ser. No. 95,784

Claims priority, application United Kingdom, Jun. 30, 1979, 22808/79

Int. Cl.³ A61F *1/00*

U.S. Cl. 3—1.9 **3 Claims**



1. A medullary canal plug comprises a relatively rigid center and a plurality of individual leaves radiating therefrom, the said leaves being so connected to the center that they can pivot from a substantially flat disc configuration to a condition in which they take up a frusto conical configuration in which the individual leaves lie in partially overlapping condition.

4,276,660

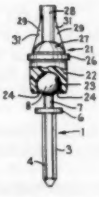
CARPOMETACARPAL THUMB JOINT

George R. Laure, Kalamazoo, Mich., assignor to Laure Prosthetics, Inc., Portage, Mich.

Filed May 25, 1979, Ser. No. 42,706

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.91 **3 Claims**



1. In a surgically implantable endoprosthetic carpometacarpal thumb joint for connection between the first thumb metacarpal bone and an appropriate hand bone, such as the trapezium or the navicular, the improvement comprising:

a one-piece metacarpal component adapted to be fixedly implanted into the upper end of the first thumb metacarpal, said metacarpal component including an elongated pin adapted for reception substantially coaxially into the first thumb metacarpal, a flange fixed on said pin adjacent the upper end thereof for limiting the extent to which the pin can enter into the first thumb metacarpal, the flange being adapted to seat against a substantially flat surface formed on the first thumb metacarpal, a pinlike support fixed to said flange and projecting therefrom in the opposite direction from said pin, and a ball fixedly secured to said pinlike support at the free end thereof; and

a one-piece base component for implanting into said appropriate hand bone, said base component including an enlarged base member constructed of a molded plastic and having a recess formed therein which opens outwardly through an opening formed in one end thereof, said recess defining a substantial portion of a sphere such that central sections through said recess define an arcuate extent in excess of 180°, said base member defining thereon a resilient lip in surrounding relationship to the opening into said recess for snappably receiving said ball directly within said recess and retaining same therein;

said one-piece base member also including a projection fixed to and projecting outwardly from the end thereof which is opposite from but approximately aligned with the recess opening, said projection having means associated therewith for permitting the projection to be nonrotatably implanted into said appropriate hand bone, said projection and said pin being substantially aligned with one another and with the center of said recess when the metacarpal and base components are positioned in a substantially straight positional relationship;

said one-piece base component further including a flange fixed to and projecting outwardly from said base member for limiting the extent of movement thereof into the appropriate hand bone, said flange seating against a substantially flat surface formed on said hand bone for stabilizing said base member, and the base member at the end thereof opposite said recess opening being provided with an outwardly projecting contoured portion of partial spherical shape for reception into a suitably and similarly shaped recess formed in the appropriate hand bone, said contoured portion being positioned directly adjacent and projecting outwardly from the flange fixed to said base member, and said projection being fixed to and projecting centrally outwardly from said contoured portion;

said metacarpal and base components being adapted for reception respectively into said first thumb metacarpal and said appropriate hand bone at such respective depths thereinto that the center of rotation between said ball and said base member will be substantially coincident with the center of rotation of the preexisting thumb joint, and said ball and said recess both being of smooth spherical configurations to permit substantially universal swiveling of the ball within the recess so as to approximate the normal universal pivoting movement of the thumb relative to the hand.

4,276,661

WAVE-MAKING APPARATUS

William H. Baker, 30 Honeysuckle Woods, Clover, S.C. 29710

Filed Jan. 30, 1979, Ser. No. 7,541

Int. Cl.[3] **E04H** *3/18;* **E02B** *3/00;* **F04D** *35/00*

U.S. Cl. 4—491 **18 Claims**

1. An apparatus for making waves in bodies of water used for swimming, comprising, in combination:

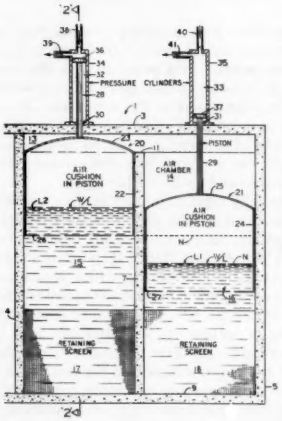
(1) a housing;

(2) a multi-compartmented chamber in the housing having at least one set of separate paired compartments open in a nonintercommunicating lower portion for separate reception of water therewithin from a body of water, and closed in an intercommunicating upper portion in a manner to provide a fluid-tight upper portion confining therewithin a volume of fluid that is common to each pair of compartments;

(3) at least one pair of pistons each disposed in separate paired compartments in the chamber, each piston being mounted across its compartment for reciprocation in alternating power and suction strokes and arranged for fluid-pressure-induced interreaction with each other in balanced strokes, with the movement of each piston engaged in a power stroke interreacting with and inducing opposed movement of an interreacting piston in a suction stroke according to pressure changes in the fluid volume common thereto;

(4) each piston having an upper face with a pressure-receiving surface responding to fluid pressure in the upper portion of its compartment, and a lower face with a pressure-receiving surface responding to water pressure in the lower portion of its compartment;

(5) a plurality of separate passages and ports in the housing, each piston-containing compartment being in flow communication with its own passage and port, each passage admitting water into the housing from the body of water, the passages and ports being isolated from each other within the housing;



whereby on the power stroke each piston pushes water below it in the lower portion of its compartment into its passage and via its port into the body of water, and on the suction stroke each piston draws water from its passage via its port into the lower portion of its compartment, the resulting alternating pulses of water flow generating waves in the body of water beyond the housing moving in an outward direction from the housing, and on the power stroke the fluid pressure reduction in the volume of fluid confined in the intercommunicating upper portions of the separate paired compartments of the interreacting piston pair combined with the water pressure below the interreacting piston of the pair results in actuating that piston on its suction stroke and puts it in position for its next power stroke after the first piston has ended its power stroke.

4,276,662

PLUG DEVICE FOR DRAINPIPE OF BASIN OR BATHTUB

Victor Young, 3rd Fl., No. 4, Alley 31, Lane 41, Wu-Feng Rd., Hsin-Tien Town, Taipei Hsien, Taiwan

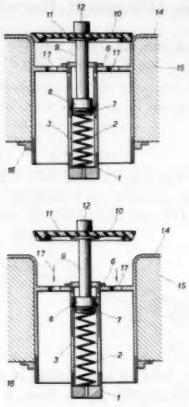
Filed Oct. 11, 1979, Ser. No. 83,981

Int. Cl.[3] **A47K** *1/14*

U.S. Cl. 4—295 **4 Claims**

1. A drain plug device for a basin or bathtub comprising a

flexible plug fixed to the upper end of a rod, a roller member rotationally mounted on the lower end of said rod, a tubular sleeve member telescopingly engaging said roller member therewithin for relative rotational and slidable movement, a spring member within said tubular sleeve for urging said roller



member and rod upwardly, means to attach said device within the drain opening, cooperating means on said roller member and the inner surface of said tubular sleeve which by depressing said plug member only cooperates to fix said plug in position to open or close the drain.

4,276,663

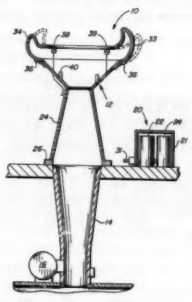
TOILET FACILITY

Walter Gensurowsky, 120 W. Granada, Phoenix, Ariz. 85003

Continuation-in-part of Ser. No. 776,447, Jun. 29, 1977, abandoned. This application Jun. 13, 1979, Ser. No. 48,248

Int. Cl.[3] **E03D** *1/00;* **B64D** *11/02*

U.S. Cl. 4—313 **7 Claims**



1. A toilet facility for disposal of solid and liquid human waste comprising:

(a) a bowl adapted to be connected to a waste disposal system, said bowl having a receptacle for the reception of waste and having a rim contoured to sealingly engage a portion of the body of the user;

(b) vacuum means for inducing a vacuum within said bowl;

(c) a spray system including a container for a spray medium, spray nozzle means located within said bowl positioned to direct a spray on a portion of the body of the user, conduit means connected said nozzle means and said spray container; and

(d) control means for controlling said vacuum means and said spray system in a predetermined cycle of operation, said control means being associated with said bowl and being actuable by the body weight of the user.

4,276,664

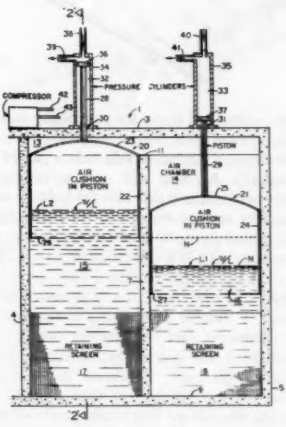
APPARATUS FOR WAVE-MAKING

William H. Baker, 30 Honeysuckle Woods, Clover, S.C. 29710

Filed Jan. 30, 1979, Ser. No. 7,542

Int. Cl.[3] **E04H** *3/18;* **E02B** *3/00;* **F04D** *35/00*

U.S. Cl. 4—491 **12 Claims**



1. An apparatus for making waves in bodies of water used for swimming, comprising, in combination:

(1) a housing;

(2) a plurality of hollow pistons in the housing mounted for reciprocation in alternating power and suction strokes and arranged in balanced groups in which the movement of each piston engaged in a power stroke is opposed to the movement of an adjacent piston engaged in a suction stroke;

(3) each piston having an open bottom for reception of water into the lower portion of the hollow piston from the body of water and a closed top confining a gas cushion therewithin between the top and any water within the lower portion of the piston, the gas cushion being under a first pressure during a power stroke of the piston, and under a second lower pressure during a suction stroke of the piston;

(4) pressurized gas supplying means for communication with and periodic replenishment of the gas within the gas cushion of the piston to maintain the gas cushion at a selected volume or pressure;

(5) a plurality of separate passages and ports in the housing admitting water into the housing from the body of water, the passages and ports being isolated from each other within the housing, with each separate passage being in fluid flow connection at one end with its own port and at the other end with the interior of one hollow piston;

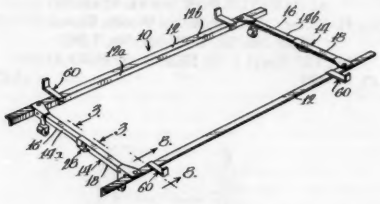
whereby on the suction stroke each piston draws water into its interior via its passage and port from the body of water, and on the power stroke each piston pushes water from its interior via its passage and port back into the body of water, the resulting alternating pulses of water flow generating waves in the body of water beyond the housing moving in an outward direction from the housing, and the gas cushion in each piston acting as a shock absorber reducing mechanical wear on the piston in reciprocating movement thereof.

4,276,665

BED FRAME OF ADJUSTABLE WIDTH

Frank J. Mis, Oak Lawn, Ill., assignor to Harris Hub Co., Inc., Harvey, Ill.

Filed Oct. 4, 1979, Ser. No. 81,765
Int. Cl.[3] A47C 19/04
U.S. Cl. 5—184 9 Claims



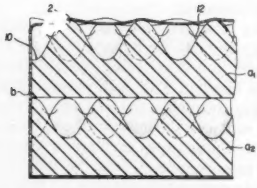
1. An adjustable bed frame for supporting mattress means in spaced relationship to a floor, comprising: a pair of spaced, parallel, horizontally disposed side rails, a pair of spaced, parallel, horizontally disposed end rails extending substantially transversely between said side rails for holding said side rails in spaced, parallel relationship, each end rail including first and second elongated elements each having at least one wall, said first element having a first end mounted to one of said side rails and said second element having a first end mounted to the other of said side rails, each of said elements having a second end disposed in slidable relationship to one another along the axis of said elements, said first element having a series of teeth along one edge of said wall and extending along the axis of said first element, generally L-shaped pawl means pivotally mounted to said second element, thin, flat leaf spring biasing means having one end secured to said pawl and an opposite end for engagement with said end rail, said pawl means having one leg to engage said teeth one at a time, said teeth facing in a direction such that said pawl is free to ride over said teeth when said first and second elements are moved inwardly toward one another, engagement between said one leg of said pawl and one of said teeth preventing said first and second elements from moving outwardly relative to one another, and said pawl having a second leg which is engageable by a user to counteract the bias of the leaf spring biasing means to release said one leg from said teeth for adjusting the width of said bed frame.

4,276,666

MATTRESS

Junji Yamada, Nihonbashi, assignor to Yamada Co., Ltd., Melbourne Plaza, Hong Kong

Filed Aug. 20, 1979, Ser. No. 68,069
Claims priority, application Japan, Dec. 12, 1978, 53-153870
Int. Cl.[3] A47C 27/14, 27/15
U.S. Cl. 5—481 3 Claims



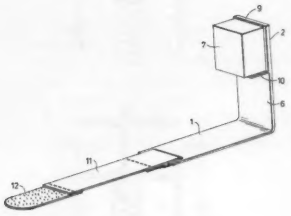
1. A mattress comprising a sponge having a specific gravity of 0.035 and being compressed about 65% of the thickness thereof by the load of 30 Kg per 314 cm^2, wherein said sponge is provided with surface protruberances so that it can be compressed about 65% the thickness thereof by a load of 25 Kg per 314 cm^2, whereby a person weighing 57 kg, when lying on the mattress, does not feel the ground below said mattress.

4,276,667

DEVICE FOR HOLDING BED CLOTHES IN POSITION

Barry C. Osbourne, 3 Cameron St., Herne Bay, Auckland, New Zealand

Filed Jan. 12, 1979, Ser. No. 3,097
Int. Cl.[3] A47C 21/02
U.S. Cl. 5—498 4 Claims



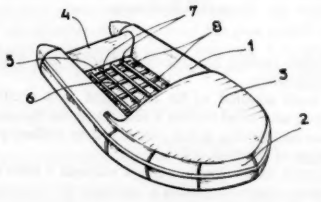
1. A device for holding bed clothes in position, said device comprising: a substantially planar base, a substantially planar head portion which projects in a substantially upright manner from the base, at or near one end of the base, gripping means located on the inner surface of the head portion for gripping bed clothes against a side of a mattress, said gripping means comprising a block of rubber having horizontal ribs or corrugations, said gripping means being located adjacent a flange member having a thickness less than said block of rubber and attached to said head portion, and mattress engaging means comprising a piece of flexible material having a plurality of small hooking means extending from its upper surface, said flexible material being attached to the base of the device by tensioning means comprising an elastic strap such that the hooking means is engagable with the underside of the mattress; the construction and arrangement being such that, in use, the device is positioned on a bed with the base passing under the mattress and engaging with the mattress as aforesaid and with the head portion passing up a side of the mattress to grip the bed clothes between the head portion and the side of the mattress.

4,276,668

DEVICE FOR HOLDING IN POSITION THE FORWARD PORTION OF AN INFLATABLE BOAT

Jean-Pierre Lefebvre, Joinville-le-Pont, France, assignor to Creusot-Loire, Paris, France

Filed Oct. 25, 1979, Ser. No. 87,969
Claims priority, application France, Oct. 30, 1978, 78 30737
Int. Cl.[3] B63B 7/08
U.S. Cl. 9—2 A 3 Claims



1. In combination with an inflatable boat including a tubular float forming the periphery of the boat and defining a bow of streamlined shape and a bottom consisting of a grating of rigid material and of a sheathing of flexible and impermeable mate-

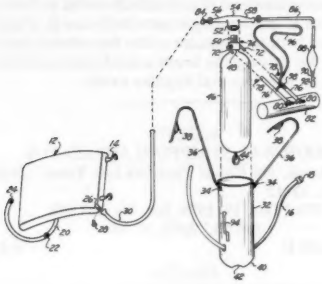
rial located at the bottom portion of the boat, a device for holding in position the forward portion of the boat to avoid excessive deformation of the bow under the force of the waves, said device comprising a torsion-bar fixed onto the grating and arranged transversely with respect to the boat, a rigid stay-bar bent so as to reproduce the shape of the bow and having at least one of its ends connected to said torsion-bar, a rigid bearing surface integral with the forward portion of the boat and supporting the central bent portion of the stay-bar for holding in position this forward portion by an elastic force exerted by the torsion-bar, which opposes the lifting forces exerted by the waves upon the bow of the boat.

4,276,669

AUTOMATICALLY-INFLATABLE LIFE PRESERVER

Virgilio Suba, 1050 Campbell Ave., Detroit, Mich. 48209

Filed Jan. 23, 1978, Ser. No. 871,176
Int. Cl.[2] B63C 9/20
U.S. Cl. 9—313 **1 Claim**



1. An automatically inflatable life preserver adapted to sustain the wearer thereof in the water, said life preserver comprising

an inflatable flotation envelope of flexible gas-tight material,

a life preserver attachment structure connected to said flotation envelope and adapted to extend over the wearer's shoulders and including means for detachably securing said structure to the wearer's body.

a compressed-gas-operated audible alarm device connected to said attachment structure,

bladder means connected to said alarm device, said bladder means becoming inflated upon the immersion of said life preserver in the water and thereby buoying up said alarm device above the water such that said alarm device emits sounds directly above the water,

a compressed gas supply assembly mounted on said attachment structure and connected to said flotation envelope,

said gas supply assembly including a compressed gas tank unit adapted to contain a compressed gas and a normally-closed rotary gas distribution valve unit disposed between said compressed gas tank unit and said envelope and between said compressed gas tank unit and said alarm device and in communication with said envelope and also with said alarm device,

said rotary gas distribution valve unit including a valve casing and a rotary valve member journaled in said casing and rotatable between closed and open positions respectively closing and opening gas flow from said compressed gas tank unit to said envelope and also to said alarm device,

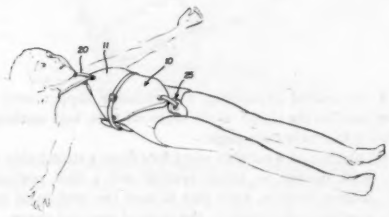
and a float device operatively connected to said rotary valve member and responsive to the immersion thereof in water to rotate said rotary valve member from its normally-closed position to its open position establishing compressed gas flow from said compressed gas tank unit through said gas supply assembly to said envelope and also to said alarm device whereby to inflate said envelope and said bladder means and sound said alarm device automatically upon immersion thereof.

4,276,670

SWIMMER'S FLOATATION AID

John L. Marchello, and Barbara L. Marchello, both of P.O. Box 100, New Hudson, Mich. 48165

Filed Oct. 17, 1979, Ser. No. 85,820
Int. Cl.[3] B63C 9/08
U.S. Cl. 9—337 **3 Claims**



1. A swimmer's floatation aid comprising:

a pair of substantially flat, thin, resilient, buoyant, approximately diamond shaped sheets, each having an upper corner, a lower corner and a pair of side corners;

said sheets being dimensioned to be applied against the front and the rear surfaces of a human torso with their upper corners located a short distance below the neck area, their lower corners located a short distance above the crotch area, and the side corners being roughly in the waist area with adjacent side corners of the two sheets being close to each other;

each sheet being formed with enlarged openings through the upper, lower, and side corners respectively;

strap means interconnecting the upper corners and extending over the shoulder portions of the torso, said strap means interconnecting the upper corners comprising a pair of narrow, flexible strap members, each arranged to extend over the swimmer's shoulder on opposite sides of the neck, and one end of the straps looped through a single enlarged opening in the upper corner of one sheet and the opposite end of said straps looped through a single enlarged opening in the upper corner of the other sheet;

strap means interconnecting the lower corners and extending around the crotch area between the legs of the swimmer, said strap means interconnecting the lower corners including an elongated strip of flexible, resilient, buoyant material formed of substantially the same material as the sheets, to thereby maintain the position of the sheets on the swimmer's body during swimming activity and to increase the floatation support in the crotch area of the torso;

and strap means interconnecting the adjacent side corners, said strap means interconnecting the side corners comprising a long, narrow strap of a length to extend around the swimmer's body approximately in the waist area thereof, and to pass through adjacent corner openings, and including releasable fastening means for connecting the opposite ends of the strap together and for releasing the strap from around the swimmer's body;

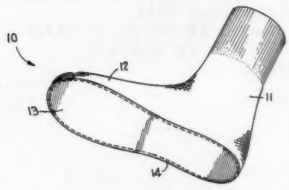
wherein said sheets generally conform to the shape of the torso, without substantially bulging therefrom, and wherein the swimmer's arms, shoulder and shoulder muscle portions, and the hip and upper leg portions are uncovered and unrestricted so that the aid provides a limited floatation assistance, but avoids interference with swimming activity movements of the swimmer's body.

4,276,671

METHOD OF MAKING A SLIPPER SOCK

Florence Melton, 1000 Urlin Ave., Columbus, Ohio 43212

Filed Dec. 4, 1979, Ser. No. 100,228
Int. Cl.³ A43D *9/00*; A43B *1/02*
U.S. Cl. 12—142 T **8 Claims**



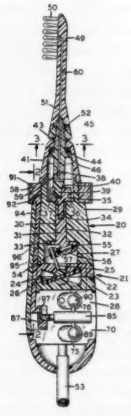
1. A method of forming a stretchable slipper sock which conforms to the shape of the wearer's foot, said method comprising the following steps:
(a) placing on a suitably sized foot form a stretchable knitted sock having an upper portion and a foot portion with unitary bottom, such that at least the bottom of the foot portion is stretched to the desired size and shape,
(b) adhering a suitably sized thin and flexible bottom sole to the bottom of the stretched foot portion of the sock by means of separate adhering means located at the extremities of the heel and toe portions of the bottom sole,
(c) removing the sock with bottom sole attached thereto from the foot form, and
(d) stitching together the periphery of the bottom sole to the bottom of the foot portion of the sock while the bottom of the foot portion of the sock is simultaneously stretched to conform to the size of the bottom sole.

4,276,672

POWER TOOTHBRUSH OR THE LIKE WITH ORBITAL BRUSH ACTION

Walter D. Teague, Jr., Tweed Blvd., Nyack, N.Y. 10960, and Arthur T. Sempliner, 37-04 Van Nostrand Pl., Douglaston, N.Y. 11363

Division of Ser. No. 848,807, Nov. 7, 1977, Pat. No. 4,175,299. This application Aug. 29, 1979, Ser. No. 70,689
Int. Cl.³ A46B *13/06*
U.S. Cl. 15—22 R **8 Claims**



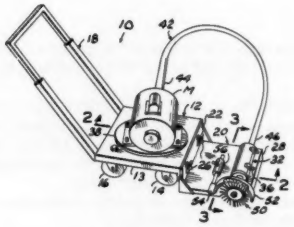
1. A powered toothbrush appliance or the like, comprising
(a) a housing,
(b) said housing being of a length suitable to be held by a human hand,
(c) a non-rotatable, orbitally movable wobble shaft mounted for universal pivoting movement in said housing and supporting a standard toothbrush element including a brush end,
(d) the brush end of said toothbrush element being movable by said wobble shaft through a first orbital path of predetermined diameter suitable for oral hygiene,
(e) orbital output drive means mounted in said housing and comprising a fluid-powered nutating action motor having an output element movable through a second orbital path of predetermined diameter,
(f) said orbital output drive means further including a rotary member journalled in said housing and driven to rotate about its axis by said orbitally moving output element,
(g) said rotary member being engageable with an end of said wobble shaft for driving said end through a third orbital path of predetermined diameter,
(h) the diameter of said third orbital path being substantially less than the diameter of said second orbital path whereby the length of said housing is suitable for use as a hand held appliance with the diameter of the first orbital path being suitable for driving the brush end of the toothbrush element in an effective oral hygiene stroke.

4,276,673

FLOOR WAX STRIPPING APPARATUS

Edward E. Brook, 310 United Founders Life Tower, Oklahoma City, Okla. 73112

Filed Dec. 19, 1979, Ser. No. 105,323
Int. Cl.³ A47L *11/14*
U.S. Cl. 15—49 C **4 Claims**



1. A machine for removing wax from the marginal edge of a floor adjacent a mopboard, or the like, comprising:
mobile frame means including a handle at one side thereof for moving the frame means across a floor surface;
a motor having a horizontally disposed drive shaft;
means mounting said motor on said frame means for angular rotation of the motor about a vertical axis;
a flexible shaft connected at one end portion with and driven by said drive shaft;
a floor wax removing disk or brush coaxially secured to the other end of said flexible shaft; and,
means connecting said flexible shaft other end portion with said frame means for vertical movement toward and away from the surface of a floor with the plane of said disk or brush disposed vertically and parallel with the direction of movement of said frame means.

4,276,674

ROTARY BROOM FOR SWEEPER

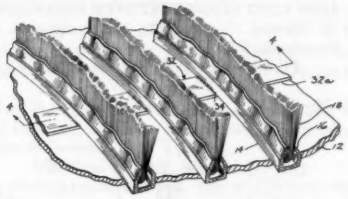
Frederick B. Hunt, Wauwatosa, Wis., assignor to Milwaukee Dustless Brush Co., Milwaukee, Wis.

Filed Feb. 4, 1980, Ser. No. 118,501
Int. Cl.³ A46B *7/10*
U.S. Cl. 15—182 **16 Claims**

1. An improved brush for use on a rotary broom having a

central core extendable longitudinally along the axis of rotation of the broom, said improved brush comprising:

sweeping brush means having turns spacedly positionable along the periphery of the core, the turns of said sweeping brush being free to move at least longitudinally along said core; and



spacer means interconnecting adjacent turns of said brush at a discrete circumferential location on said turns for limiting the longitudinal movement of said turns relative to each other for providing a desired longitudinal spacing to said turns along said core.

4,276,675

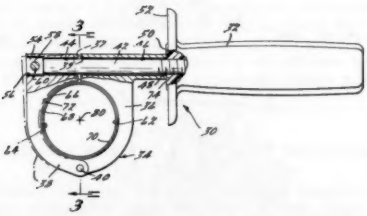
AUXILIARY HANDLE FOR A POWER TOOL

Peter P. Pioch, Idstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 7, 1980, Ser. No. 119,560

Int. Cl.³ A47B *95/02*; E05B *1/00*

U.S. Cl. 16—111 R **8 Claims**



1. In a power tool having a generally elongated housing and an auxiliary handle for supporting the forward end of said tool, the improvement comprising:

clamping means for securing said auxiliary handle to the forward end of said tool so that the angular position of said handle relative to the longitudinal axis of said tool is adjustable through three dimensions, including an inner member positioned around and adapted to be compressible on the forward end of the tool and having a substantially spherically contoured outer surface, an outer clamping member connected to said handle and having an inner clamping surface complimentary to said outer surface thereby permitting said outer clamping member to be moved about the spherical zone defined by said outer surface, and means operative on said outer clamping member to apply a clamping force on said inner member to compress said inner member causing it to grip the forward end of said tool.

4,276,676

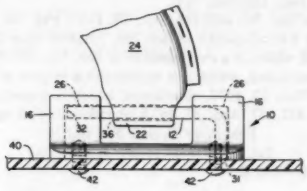
HANDLE MOUNTING DEVICE

Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.

Filed Jul. 30, 1979, Ser. No. 62,033

Int. Cl.³ A47B *95/02*

U.S. Cl. 16—126 **7 Claims**



1. A device for mounting a handle on a luggage case or the like comprising a stud having a base, an aperture extending through the base and sized to pass an end of a handle, a slot in the base having a width substantially less than the width of the aperture and having first and second slot portions intersecting opposite ends of said aperture and extending beyond said ends and upwardly with said aperture from the underside of the base to a terminus within the interior of the stud, and a pin sized to fit in the slot, the pin being adapted to be inserted through a hole in the end of the handle to support the handle in the stud.

4,276,677

TRAVELING COVER

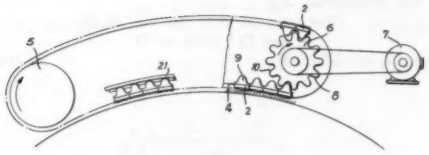
Wolfgang Piske, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co. KG., Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,147

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2742015

Int. Cl.³ D01G *15/08*

U.S. Cl. 19—102 **3 Claims**



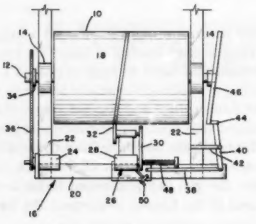
1. A revolving flats arrangement for carding equipment, comprising: guide means with two sides; flats sliding with both ends on said guide means; deflecting roller means having a driving element, said driving element having members for engaging said flats, said flats being pressable against said guide means by an elastic element, said guide means restricting said flats to a predetermined path, said flats being substantially held in predetermined position by said guide means, said flats forming a gap on one side and at one location; vacuuming means for communicating with said gap inside said revolving flats arrangement and between said deflecting rollers; said flats having clothing located on a side facing away from clothing on a card cylinder; axially movable cleansing means for cleaning the clothing of said flats; said deflecting roller means comprising two deflecting rollers, said flats being arranged between said deflecting rollers only on one side facing said card cylinder; return means for returning said flats; one of said deflecting rollers comprising driving means and having a sprocket-shaped portion, said flats having a peripheral surface shape to conform to said sprocket-shaped portion when said flats are

located adjacent to each other, said sprocket-shaped portion engaging corresponding surface portions of said flats for moving said flats slidingly along said guide means toward the other deflecting roller.

4,276,678
RING DOFFER

James W. Howe, Jr, Durham, N.C., assignor to Gunter & Cooke, Inc., Durham, N.C.

Division of Ser. No. 860,380, Dec. 14, 1977, Pat. No. 4,172,342, which is a continuation of Ser. No. 799,469, May 23, 1977, abandoned, which is a continuation of Ser. No. 457,973, Apr. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 414,995, Nov. 12, 1973, abandoned, which is a continuation of Ser. No. 392,127, Aug. 27, 1973, abandoned. This application Feb. 9, 1979, Ser. No. 10,574
Int. Cl.[3] D01G *15/46*; B24B *1/00*
U.S. Cl. 19—106 R **4 Claims**

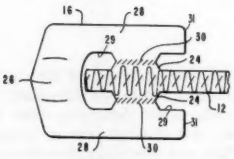


1. A ring doffer having a clothing cover of metallic wire teeth that has been disabled at least in one circumferential zone, said zone being of substantially uniform individual width and having a reverse helix pattern the pitch of said helical pattern followed by said zone reversing only once in every complete revolution of the doffer, and said reverse helix pattern following the circumference of the doffer.

4,276,679
SLIDE FASTENER

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 26, 1979, Ser. No. 24,221
Int. Cl.[3] A44B *19/42*
U.S. Cl. 24—205.16 R **9 Claims**

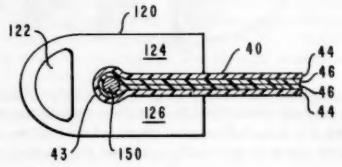


1. A slide fastener comprising
a pair of mounting tapes having adjacent side edges;
a plurality of thermoplastic coupling elements mounted on the adjacent edge of each of the coupling elements, each of the coupling elements including a head portion with a pair of leg portions extending therefrom on opposite sides of the respective mounting tape;
a thickened rib formed on at least one side of each of the mounting tapes near the adjacent edge thereof;
said leg portions each having a heel and a straight interior surface extending from adjacent the respective head portion to the respective heel; and
a raised attachment boss formed on the interior surface of each of the leg portions of the coupling elements, the attachment bosses being spaced apart from the respective head portions and the respective heels and being fused to the respective ribs so that the coupling elements are securely attached to the respective mounting tapes.

4,276,680
LOW COST SLIDE FASTENER STRINGER

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 19, 1979, Ser. No. 95,829
Int. Cl.[3] A44B *19/40*
U.S. Cl. 24—205.16 R **3 Claims**

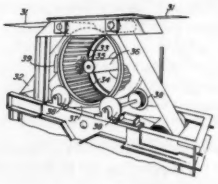


1. A low cost slide fastener stringer comprising
a tape folded lengthwise to define a folded edge; and
a row of coupling elements attached along the folded edge of the tape;
the tape including a layer of cross-laminated oriented polyolefin film, and a layer of high density polyolefin bonded fiber film;
the tape being folded so that the bonded fiber film is outermost.

4,276,681
IN AN APPARATUS FOR FORMING BIAXIALLY ORIENTED NONWOVEN FABRICS

Preston F. Marshall, Walpole, Miss., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 877,282, Feb. 13, 1978, Pat. No. 4,228,123, which is a continuation-in-part of Ser. No. 506,843, Sep. 17, 1974, Pat. No. 3,969,561. This application Jun. 21, 1979, Ser. No. 50,575
Int. Cl.[3] D04N *1/46*
U.S. Cl. 28—105 **6 Claims**



1. In an apparatus for forming a biaxially oriented nonwoven striped fabric having a machine direction to cross direction tensile strength ratio of less than 2 to 1, said apparatus including holding means for sandwiching a carded nonwoven web between a tensioned first screen and a rigid means having fluid-pervious areas thereon; means for applying a fluid force to said holding means that is capable of rearranging the fibers in said web; and, collection means for removing the thusly treated web from said apparatus and collecting same, the improvement comprising said rigid means having fluid-pervious areas thereon that includes a drum consisting essentially of spaced-apart striping bars laterally disposed across a second screen on said drum and around the circumference of said drum, said drum being juxtaposed with at least a portion of said tensioned first screen so that said web can be sandwiched

therebetween in a manner that said striping bars are normal to the axis of the parallelized fibers of the carded web; said means for applying said fluid forces including a bank of fluid nozzles disposed within said drum and behind the portion of said striping bars that is in juxtaposed relation with said tensioned first screen, so that the fluid forces emanating from said nozzles strike the fibers in said web and rearrange them.

4,276,682

DEVICE FOR LAYING DOWN CONTINUOUS MATERIAL BY MEANS OF A PAIR OF PROFILED ROLLS

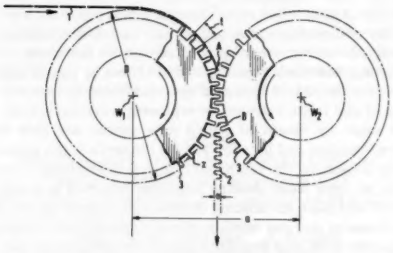
Klaus Rüber, Wehringen, and Karl Zill, Gersthofen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 12, 1979, Ser. No. 75,142

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840122

Int. Cl.³ B65H *54/80*

U.S. Cl. 28—289 **10 Claims**



1. A device for laying down in spinning cans a tow of filaments with the aid of a pair of profiled rolls, comprising delivery means supplying the tow at a delivery speed to the pair of profiled rollers, the profiled rolls having peripheries which are uniformly provided with teeth having a pitch and which form an engagement zone, the width of the teeth in the engagement zone of the pair of profiled rolls being at least the same in the radial direction outwardly from the center point of each roll and a small fraction of the pitch of the teeth, the profiled rolls having drive means rotating them at a laying-down speed at which the tow is laid down in the spinning cans, and the laying-down speed being reduced relative to the delivery speed by over 15% without winding up around the profiled rolls.

4,276,683

METHOD FOR WINDING ELECTRODE FOILS AND SEPARATORS FOR CAPACITOR

Toshio Konno, Aichi, and Masatoshi Hayakawa, Nagoya, both of Japan, assignors to CKD Corporation, Komaki, Japan

Filed Aug. 17, 1978, Ser. No. 934,596

Claims priority, application Japan, Oct. 4, 1977, 52-119389

Int. Cl.³ H01G *4/32*

U.S. Cl. 29—25.42 **3 Claims**

1. A method for winding electrode foils and separators into a small size capacitor, comprising:

placing a plurality of first lead wires on a first electrode foil at first predetermined intervals and placing a plurality of second lead wires on a second electrode foil at second predetermined intervals greater than the first intervals, said intervals being according to the desired capacitance of the capacitor;

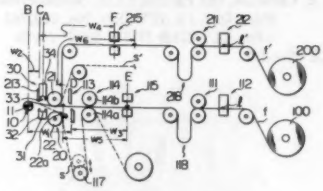
superimposing separators and the first and second foils;

engaging the leading end of said superimposed electrode foils and separators with a winding shaft and thereafter rotating said winding shaft for starting winding of the foils and separators;

stopping rotation of said winding shaft when one of the first lead wires attached to said first electrode foils at a position spaced a first predetermined distance along the wound foils and separators from the leading end is at a first radial position relative to said leading end and then cutting said first electrode foil at a position spaced a second predetermined distance from said one lead wire, said first and second predetermined distances together equalling said first interval;

again rotating said winding shaft to further wind said superimposed electrode foils and separators;

again stopping rotation of said winding shaft when a second lead wire attached to said second electrode foil at a position spaced a third predetermined distance along the



wound foils and separators from the leading end is at a second radial position relative to the leading end and which second radial position is diametrically opposite the radial position of said first electrode on said first foil with respect to the center of the capacitor, and cutting said second electrode foil and the separators at a position spaced a fourth predetermined distance from said second lead wire, said third and fourth predetermined distances together equalling said second interval; and

again rotating said winding shaft to wind the trailing end of said second electrode foil and the separators into a finished capacitor.

4,276,684

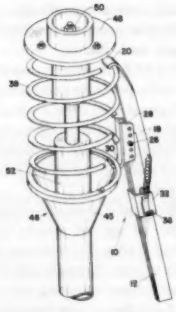
HAND TOOL SPRING COMPRESSOR

Charles T. Mattson, 5184 Sonoma Hwy., Santa Rosa, Calif. 95405

Filed Mar. 7, 1980, Ser. No. 128,238

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—227 **5 Claims**



1. A hand-operated coil spring compressor comprising:

a relatively straight handle;

a first hook at the end of said handle adapted to engage a coil of a spring;

an arm pivoted near one end to said handle intermediate the ends thereof;

a second hook at the other end of said arm adapted to engage another coil of said spring;

a sleeve slidable on said handle and movable to engage over said arm when same is aligned with said handle;

light spring means biasing said sleeve toward said end of the handle; and

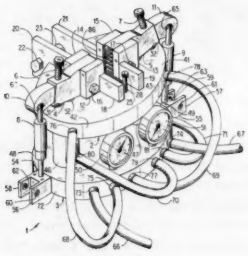
a surface on said arm at said one end adapted to engage and retract said sleeve back in opposition to said spring means to enable passage of said one end into alignment with said handle.

4,276,685

PORTABLE IN-LINE PRESS

David K. Callahan, 102 Partridge Cir., Summerville, S.C. 29483

Filed Dec. 12, 1979, Ser. No. 102,764
Int. Cl.³ E21B *19/00*; B23P *19/04*
U.S. Cl. 29—252 **24 Claims**



1. A device for removing a first object from a second object, in which said first object is set fast, comprising:

(a) a first manifold with a first opening through which said first object may be positioned;

(b) a second manifold with a second opening through which said first object may be positioned with said second object pressed against the side of said second manifold furtherest from said first manifold;

(c) object securing means rigidly secured to said first manifold on the side of said first manifold furtherest from said second manifold;

(d) first hydraulic means connected to and within said device, operative to control said object securing means, said first hydraulic means comprising:

(1) first hydraulic pressure producing means connected to said device; and

(2) a plurality of first pistons operative responsive to said first hydraulic pressure producing means and positioned to press against said object securing means; and

e. second hydraulic means connected to and within said device operative to vary the distance between said first manifold and said second manifold, said second hydraulic means comprising:

(1) second hydraulic pressure producing means; and

(2) a plurality of second pistons operative responsive to said second hydraulic pressure producing means and positioned to pass through said first manifold and press against said object securing means;

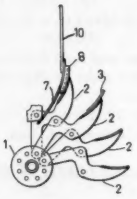
whereby said first object may be positioned within said first opening of said first manifold and said second opening of said second manifold with said second object pressed against said side of said second manifold furtherest from said first manifold, said first hydraulic means can be activated to secure said first object within said object securing means, and said second hydraulic means can be activated to move said first manifold apart from said second manifold thereby removing said first object from said second object.

4,276,686

REPLACEMENT SPOONS & FIXTURES FOR ROTARY HOE

Jack A. Tulen, R.R. #1, Coatsworth, Ontario, Canada (N0P 1H0), and James L. Tulen, R.R. #1, Wheatley, Ontario, Canada (N0P 2P0)

Filed Oct. 9, 1979, Ser. No. 83,158
Int. Cl.³ B25P *27/00*
U.S. Cl. 29—270 **3 Claims**



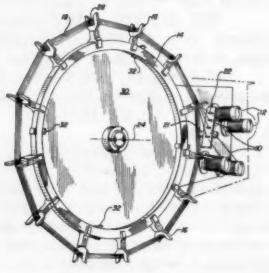
1. For a rotary hoe wheel having a hub, a plurality of teeth having end portions attached to said hub and extending outwardly therefrom, means spaced outwardly from said hub for attaching said teeth together to hold them in spaced relationship relative to said hub, and spoons affixed to free end portions of said teeth; a device for replacing worn out spoons with new ones, by means of which new spoons are held in the proper position and location against the teeth as the spoons are being affixed to the teeth, said device comprising a narrow plate, an open faced shallow container attached to a side surface of said plate for holding therein a single new spoon, locating means at one end portion of said narrow plate effective to cooperate with said attaching means for positioning said container relative to a tooth to which a new spoon is to be affixed, and handle means connected to the other end portion of said narrow plate for extending outwardly beyond said container, whereby said device can be held by said handle means when a spoon located in said container is to be affixed to one of said teeth.

4,276,687

METHOD OF WINDING CAPILLARY FIBER BUNDLES

William J. Schnell, Wheeling, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 21, 1979, Ser. No. 41,112
Int. Cl.³ B65H *54/02*, *54/28*
U.S. Cl. 29—407 **10 Claims**



1. The method of making bundles of tubular capillary fibers of semipermeable membrane material for use in a membrane diffusion device by winding said capillary fibers onto a reel member to form an annular assembly of said fibers, and thereafter cutting said annular assembly into separate bundles, the improvement comprising, in combination:

feeding said capillary fibers to said reel through guide slot

means elongated in a direction generally parallel to the axis of rotation of said reel and of essentially the width of said annular assembly, at a tension on said capillary fibers sufficiently low to allow said capillary fibers to move laterally about while winding in said guide slot means in generally random manner, whereby said bundles comprise fibers in generally non-parallel, crossing arrangement with adjacent fibers.

6. The method of making bundles of tubular capillary fibers of semipermeable membrane material for use in a membrane diffusion device by winding said capillary fibers onto a reel member to form an annular assembly of said fibers and thereafter cutting said annular assembly into separate bundles, the improvement comprising, in combination:

feeding said capillary fibers to said reel through guide slot means elongated in the direction generally parallel to the axis of rotation of said reel, said guide slot means being of essentially the width of said annular assembly, at a tension on said capillary fibers sufficiently low to allow said capillary fibers to move laterally about while winding in said guide slot means in generally random manner, whereby said annular assembly comprises loops of strands in generally non-parallel, crossing arrangement with adjacent strand loops; wrapping portions of said annular assembly in flexible sheets; and thereafter cutting individual fiber bundles out of said strand loops, making said cuts through the wrapped sheets, whereby individual bundles having an improved cut of the bundle ends are obtained.

4,276,688

METHOD FOR FORMING BURIED CONTACT COMPLEMENTARY MOS DEVICES

Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 21, 1980, Ser. No. 113,505
Int. Cl.³ H01L *21/86, 21/88*
U.S. Cl. 29—571 **7 Claims**

1. A method of fabricating a CMOS device having buried contacts therein, comprising the steps of:

providing a body of semiconductor material of a first conductivity type, the body having a common boundary surface;

modifying regions of the body of semiconductor material, at the common boundary surface, to a second opposite conductivity type, to form alternate regions of adjacent first and second conductivity type regions;

providing one first conductivity type region with a first layer of gate insulator;

depositing a layer of refracting metal on the exposed portions of the common boundary surface and the layer of gate insulator material;

growing a layer of doped polycrystalline silicon on the deposited metal;

providing the layer of doped polycrystalline silicon with a patterned layer of photoresist and etching the unmasked portion of the polycrystalline silicon and metal layer thereunder to form a doped polycrystalline silicon gate electrode on the layer of gate insulator over a first conductivity type region;

growing a second gate insulator layer on the body of semiconductor material at a given temperature sufficiently high to form a first buried contact at a junction of abutting first and second conductivity type regions and a second buried contact at a second conductivity type region;

forming a second doped polysilicon gate member on the second layer of gate insulator over a second conductivity type region;

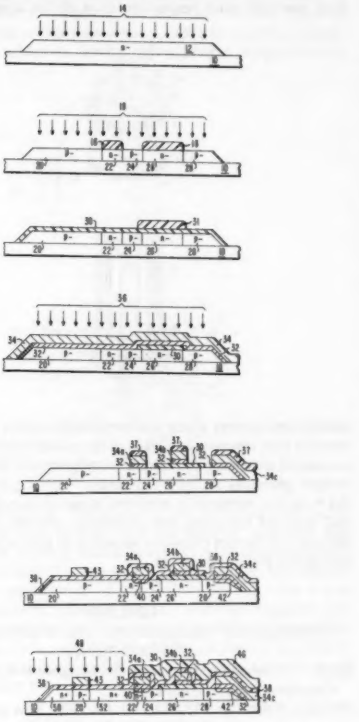
providing a portion of the body with a layer of masking material and ion implanting second conductivity type active areas in the unmasked portion of the body;

removing the masking material from the previously masked portion of the body;

providing the previously unmasked portion with a layer of masking material and ion implanting a first conductivity type material in the unmasked portion of the body to form active areas therein;

removing the masking material from the masked portion of the semiconductor body;

providing the body with a layer of insulating material and forming contact openings therein; and



depositing metallic leads in the contact openings, one lead in direct ohmic connection with one active area of a first conductivity type, another lead in ohmic contact with the first and second doped polysilicon gate members and a further lead in ohmic contact with the polycrystalline silicon region adjacent the first buried contact.

4,276,689

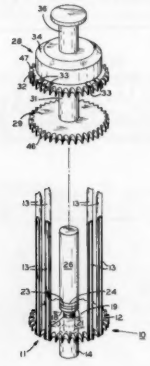
APPARATUS AND METHOD FOR AXIAL INSERTION OF DYNAMOELECTRIC MACHINE END TURN INSULATION

Palmer D. Urick, Decatur, and Robert H. Bienz, Fort Wayne, both of Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 5, 1979, Ser. No. 27,370
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—596 **39 Claims**

1. A method of substantially simultaneously placing a plurality of between phase insulators on a stator assembly comprising a magnetic core having a pair of opposite end faces, a central bore therebetween, and a plurality of slots that open into the bore, and also having at least one phase winding supported on the core with side turn portions thereof disposed in at least some of the slots and end turn portions thereof disposed adjacent the opposite end faces of the core, wherein the phase insulators respectively include a pair of spaced apart end turn insulating portions interconnected by at least one leg extending

therebetween, the method comprising the steps of: containing at least a part of one of the end turn insulating portions of the phase insulators in a generally cylindrical configuration; relatively moving the phase insulators and the core and thereby causing relative movement of the one end turn insulating portion of the phase insulators along the bore of the core and also thereby causing the at least one leg of the phase insulators to at least partially enter respective slots of the core and undergo



relative movement along such respective slots; displacing the one end turn insulating portion of the phase insulators from the contained generally cylindrical configuration thereof in a direction generally radially outwardly from a general region of the bore into respective positions adjacent one of the opposite end faces of the core; and thereafter placing another phase winding on the core directly adjacent at least a part of at least one of the phase insulators.

4,276,690

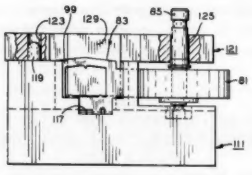
METHOD OF ASSEMBLING COMPONENTS OF A THERMOSTAT

Ralph W. Gustafson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 845,383, Oct. 25, 1977. This application Sep. 17, 1979, Ser. No. 76,166

Int. Cl.³ H01F *41/02*

U.S. Cl. 29—602 R **11 Claims**



1. A method of assembling a pair of magnetic material elements with an assembly having a bimetal element secured between means for carrying the magnetic material elements and means adapted for supporting the assembly, the method comprising the steps of:

(a) disposing the carrying means in a fixed position;

(b) locating a free position of the supporting means with respect to the carrying means in its fixed position; and

(c) associating the magnetic material elements with the carrying means therefor and arranging a preselected section of each magnetic material element so as to be disposed generally in symmetrical relation with the supporting means in the located free position thereof, respectively.

4,276,691

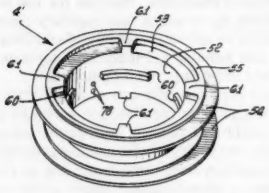
ROTARY NYLON LINE VEGETATION CUTTER

Vincent A. Palmieri, and John P. Palmieri, both of 3745 El Camino Dr., San Bernardino, Calif. 92410

Division of Ser. No. 925,045, Jul. 17, 1978, Pat. No. 4,185,381. This application Jun. 28, 1979, Ser. No. 52,781

Int. Cl.³ A01D *55/00*

U.S. Cl. 30—347 **2 Claims**



1. In a flexible line- whirling vegetation cutting hand tool, a rotary head for which is provided to be supported on and manipulated by the lower end of a relatively long handle equipped with power means for rapidly spinning said head on a vertical axis, the improvement comprising the following subcombination of elements:

a reserve line winding spool comprising a peripherally radially channelled annulus having a relatively large axial bore:

said bore being provided with line feeding escapement stop means which are symmetrically spaced circumferentially on said spool and are also symmetrically arranged with respect to an inter-facial radial plane of spool symmetry so as to provide duplicate primary sub sets of said stop means on opposite ends of said spool, and a single secondary sub set of said stop means lying in said interfatial radial plane.

said stop means functioning to facilitate the escapement feeding of line from said spool with either end of said spool turned upward.

4,276,692

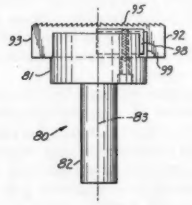
CLAMPING MEANS AND TOOL FOR MAKING IT

William A. Casler, and Phillip E. Saurenman, both of Pasadena, Calif., assignors to Clamp Manufacturing Co., Inc., South El Monte, Calif.

Division of Ser. No. 913,968, Jun. 9, 1978, Pat. No. 4,181,392, which is a continuation of Ser. No. 760,696, Jan. 19, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 80,546

Int. Cl.³ B26B *25/00*

U.S. Cl. 30—347 **9 Claims**



1. A device for cutting circular teeth into a face of an article comprising:

(a) a rotatable body having an axis of rotation;

(b) a face adapted to be juxtaposed to the face of the article;

(c) a groove in said face of the body;

(i) said groove having parallel sides spaced from each other;

(d) a cutter insert in the groove,

(i) said insert protruding outwardly from said body to an edge face;

(ii) said edge faces containing arcs of circular teeth for engaging said block face to cut teeth therein;

(iii) said arcs of circular teeth having leading edges which protrude further outwardly from said body face than the remainder portions of said teeth, thereby creating a rake at the teeth by which the cutting of teeth into the block face is performed by said leading edges.

4,276,693

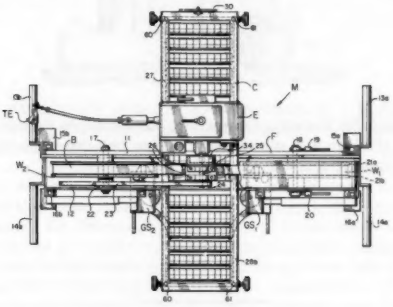
PORTABLE BOARD MILL

Joseph R. Lovas, East Stroudsburg, Pa.; Paul J. Lovas, Blairstown, N.J., and Carl F. Koelmel, East Stroudsburg, Pa., assignors to Cyloflex, Inc., East Stroudsburg, Pa.

Filed Nov. 15, 1979, Ser. No. 94,433

Int. Cl.³ B27B *15/00*

U.S. Cl. 30—380 **14 Claims**



1. In a portable mill for cutting lumber from a log, including a frame adapted to be disposed transverse to the log, means mounting a cutting blade for movement in the frame and having an effective zone of cutting, power means carried by said frame for driving said blade, and a carriage mounted to the frame for affording movement of the frame forwardly along the log as the cutting blade cuts the log lengthwise, the improvement wherein said carriage comprises:

an elongated case disposed transversely to the cutting blade and extending in both forward and rearward directions from said frame,

a series of resilient rollers mounted in said cage for rotation on the log to support the frame as it advances,

said series of rollers being disposed in closely spaced relation in said cage and extending on opposite leading and trailing sides of the blade for a distance at least as great as the effective zone of cutting,

whereby the closely spaced resilient rollers deform in response to surface irregularities on the log to produce substantially flat cuts.

4,276,694

FLUID LEVEL INDICATOR (VENT HOLES)

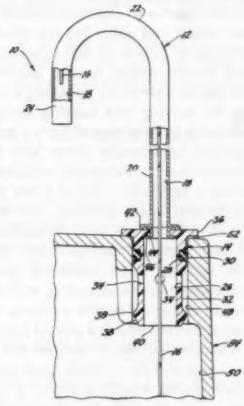
Mason E. Richardson, Clinton Township, Macomb County, Mich., assignor to Van Products Company, Vanderbilt, Mich.

Filed Sep. 18, 1979, Ser. No. 76,759

Int. Cl.³ G01F *23/04*

U.S. Cl. 33—126.7 R **8 Claims**

1. A dipstick assembly of the type used for measuring fluid levels within a sealed chamber wherein the dipstick assembly is adapted to be received in an access passageway to the chamber, said dipstick assembly comprising: a handle member having a passageway extending throughout as to allow communication therethrough, said handle member having a first straight portion, an elongated fluid level indicating member attached to and extending from said first straight portion of said handle member, a one piece cap member having an attachment end including an opening in a inwardly extending flange portion thereof, said handle member extending through said opening and being secured to said flange portion, the other end of said cap member being open, said cap member also having an outward flange head portion integral with said attachment end of said cap member for limiting the entrance of said dipstick assembly into the access passageway, said cap member including primary ventilation means comprising a longitudinally



extending passageway for allowing the ventilation of gases from said open end through said cap member and into said handle member, sealing means provided on said cap member for perfecting a seal between said cap member and the interior of the access passageway of the sealed chamber when said dipstick assembly is inserted therein, said cap member also including an auxiliary venting means for allowing the ventilation of gases from the chamber through said handle member in the event that said open end of said cap member is below the fluid level within the sealed chamber.

4,276,695

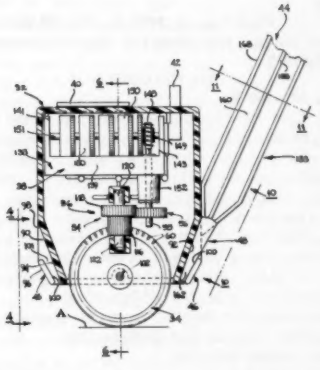
ROLLER MEASURE DEVICE

Benjamin H. Stansbury, Jr., Beverly Hills, Calif., assignor to Ronco Teleproducts, Inc., Elk Grove Village, Ill.

Filed Jun. 4, 1979, Ser. No. 45,208

Int. Cl.³ G01B *3/12*

U.S. Cl. 33—141 E **16 Claims**



1. A portable mechanical roller measure device having a

detachable segmented handle for measuring a distance along a surface from a remote position, said device comprising:

(a) a portable housing;

(b) a roller rotably mounted in said housing and having a portion protruding outside of said housing for engaging and rolling along the surface along which the distance is to be measured when the housing is moved along said surface;

(c) a resettable counter mechanism in said housing for providing a visual readout to the user of the device;

(d) transfer means for transmitting rotation of said roller to said counter mechanism so that said readout indicates the distance over which said roller has travelled;

(e) housing attachment means on said housing;

(f) an elogated handle means having handle attachment means at one end for releasably engaging and attaching to said housing for moving said housing along the surface having the distance to be measured from a position remote from said surface, said handle comprising a plurality of releasably interconnected elongated sections each having in cross section a generally vertical beam portion and a generally horizontal beam portion, said vertical beam portions being reinforced against deformation in the vertical plane of said vertical beam portions, and said elongated handle sections each including interconnection means at their ends for interconnecting with like means on the ends of other elongated handle sections, said interconnection means each comprising a pair of axially extending finger tabs, wherein said handle sections are each a single molded plastic part and the vertical beam portion of each of said molded plastic handle sections is reinforced by means of an integrally formed transversely extending flange along at least one longitudinal edge of such vertical beam portion; and

(g) locking means for physically but releasably locking interconnection means on one handle section to interconnection means on an adjacent handle section, wherein said locking means comprise mating pairs of projections, one on each of the interconnected interconnection means, said mating pair of projections being axially aligned when their respective handle sections are assembled together to limit disassembly of said handle sections, at least said finger tabs being sufficiently resilient to permit said projections to be forced past one another incident to assembly and disassembly of said handle sections with one another.

4,276,696

PRECISION LENGTH MEASURING INSTRUMENT

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,299

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850875

Int. Cl.³ G01B 7/02

U.S. Cl. 33—169 R **6 Claims**

1. In a precision length measuring instrument including a bending resistant support member, a guide member mounted to the support member, a measuring scale, a measurement carriage, and means for guiding the measurement carriage along the guide member, the improvement comprising:

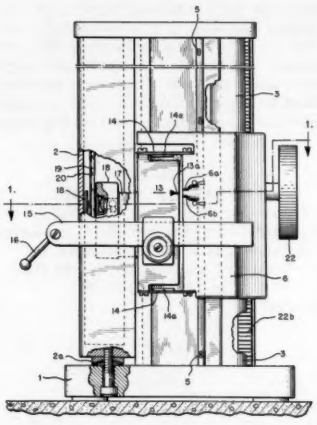
means for precisely adjusting the position of the guide member with respect to the support member at a plurality of positions along the length of the guide member, such that a first guide surface, defined by the guide member, is adjustable to a desired configuration;

means, included in the guide means, for precisely guiding the carriage along the first guide surface;

an intermediate member;

a measurement sensor, mounted on the intermediate member;

a reading unit, mounted on the intermediate member to scan the scale; and



means for mounting the intermediate member to the carriage to move in a substantially friction free manner with respect to the carriage.

4,276,697

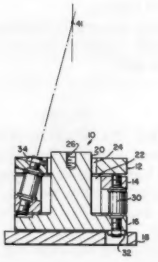
COMPLIANCE ELEMENT FOR REMOTE CENTER COMPLIANCE UNIT

Samuel H. Drake, Lexington, and Sergio N. Simunovic, Newton, both of Mass., assignors to Astek Engineering, Inc., Watertown, Mass.

Filed Apr. 21, 1980, Ser. No. 142,047

Int. Cl.³ G01B 5/25

U.S. Cl. 33—169 C **5 Claims**

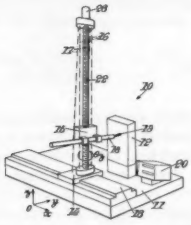


1. In a remote center compliance unit having at least first and second platforms interconnected by a plurality of compliance elements, the improvement wherein each said element comprises a multi-stranded cable enclosed within an elastomeric plug.

4,276,698
MACHINES FOR MEASURING THE DIMENSIONS OF WORKPARTS

Alain Dore, Conflans-Ste-Honorine, and Henri Judet, Paris, both of France, assignors to Societe D'Applications Generales D'Electricite et de Mecanique Sagem, Paris, France

Continuation of Ser. No. 738,884, Nov. 4, 1976, abandoned. This applicstion Oct. 23, 1978, Ser. No. 953,999
Claims priority, application France, Nov. 7, 1975, 75 34141
Int. Cl.[2] G01B *3/22, 5/20*
U.S. Cl. 33—174 L **8 Claims**

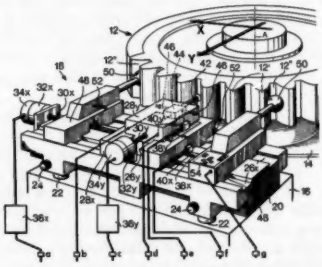


1. Machine for measuring the dimensions of a workpart, comprising a base plate constructed to receive the workpart, a mechanical structure bearing a feeler movable along orthogonal axes, devices carried by said structure for direct measurement of the movement of the feeler along said axes, optical deflection measurement means operatively associated with said structure for determining the errors of measurement or of movement due to play and deformation of movable component members of said mechanical structure along at least one of said axes and for providing electric signals representative of said errors; and computing means connected to receive said electrical signals and for computing the corrections to be made to the results provided by said devices for direct measurement.

4,276,699
METHOD AND TEST APPARATUS FOR TESTING THE TOOTH FLANK PROFILE OF LARGE DIAMETER GEARS

Armin Sterki, Uetikon; Gerd R. Sommer, Dietikon, and Walter Naegeli, Oberengstringen, all of Switzerland, assignors to Maag Gear Wheel & Machine Co. Ltd., Ziirich, Switzerland

Filed May 5, 1980, Ser. No. 147,041
Claims priority, application Switzerland, May 14, 1979, 4452/79
Int. Cl.[3] G01B *5/20, 7/28*
U.S. Cl. 33—179.5 R **11 Claims**



1. In a method of testing a tooth flank profile of large diameter gears having an axis, comprising the steps of:

providing a testing apparatus equipped with two contact elements and a measuring feeler, which is movable along an X-axis essentially parallel to a connection line between both of the contact elements and a Y-axis extending transversely with respect to the X-axis;

placing the contact elements into a respective tooth space of a gear which is to be measured;

bringing the testing apparatus into a position where both axes are located in a plane essentially normal to the axis of the gear, in order to thereby define the origin of a X-Y-coordinate system formed by both axes;

thereafter moving the measuring feeler along at least one of the tooth flanks and comparing the thus measured coordinates with reference values, the improvement which comprises;

measuring the spacing (S) between both contact elements; and determining the spacing (YO) of the coordinate origin from the gear axis according to the equation:

$$YO = \frac{S}{2} \cdot ctg\,(180° \cdot \frac{KZ}{Z}) + C$$

wherein:

C designates a constant of the testing apparatus;

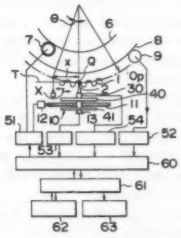
KZ designates the number of teeth between both of the contact elements; and

Z designates the total number of teeth of the gear.

4,276,700
METHOD FOR INSPECTING GEAR CONTACT PATTERNS

Takashi Tanno, and Shigemitsu Koike, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 1, 1980, Ser. No. 174,582
Claims priority, application Japan, Aug. 2, 1979, 54-98829
Int. Cl.[3] G01B *3/14*
U.S. Cl. 33—179.5 R **8 Claims**

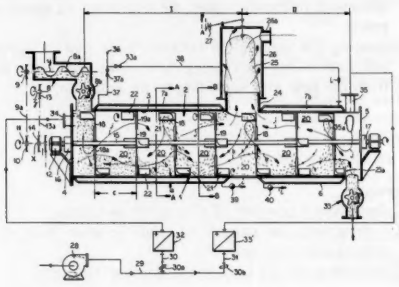


1. Method for inspecting a gear contact pattern between teeth surfaces of mutually engaging gear teeth in a pair of gears which comprises steps of determining on each of the teeth surfaces of the gear teeth a plurality of regularly located measuring points so that respective ones of the measuring points on one tooth surface correspond to the measuring points on the other tooth surface so as to provide a plurality of combinations of measuring points, measuring each tooth surface at the measuring points to detect deviations of the tooth surface from a standard tooth profile at the measuring points, calculating relative distances between the teeth surfaces in the pair of gears at corresponding measuring points on the basis of the deviations, determining a reference which is the relative distance of minimum value, counting number of the combinations of measuring points in the pair of mutually engaging teeth surfaces where the relative distances are within a predetermined limit from the reference, determining a gear contact ratio on the basis of a ratio of the counted number of the combinations of measuring points to the total number of the combinations of measuring points so that the pair of the gears accepted where the gear contact ratio is greater than a predetermined value.

4,276,701
APPARATUS FOR THE DRYING OF WET, PASTY AND/OR FUSIBLE MATERIALS

Istvan Takacs; Peter Rudolf; Bela Szabo, and György Kerey, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyár RT, Budapest, Hungary

Filed Nov. 28, 1979, Ser. No. 97,969
Claims priority, application Hungary, Mar. 21, 1979, RI 701
Int. Cl.[3] F26B *17/20*
U.S. Cl. 34—109 8 Claims



1. An apparatus for the drying of material, especially wet, pasty and/or fusible substances, comprising:

an axially elongated thermally conductive cylindrical wall defining a cylindrical drying space having a substantially horizontal axis;

means forming at least one annular heating chamber along the exterior of said wall;

means for passing a heating fluid through said heating chamber to heat said wall;

a pair of end walls dispoed at opposite axial ends of said space and closing same;

feeder means for introducing material to be dried into said space at one end thereof adjacent a respective end wall;

discharge means connected to said space at an opposite end thereof adjacent the other end wall for discharging dry material from said space;

inlet means communicating with said space at least at one of said ends thereof for introducing a hot drying fluid into said space for direct contact with the material therein;

outlet means connected to said space at a location axially separated from said inlet means for discharging said drying fluid from said space;

a shaft extending along said axis and journaled for rotation relative to said walls;

drive means connected with said shaft for rotating same;

a plurality of first disks mounted on said shaft and lying in respective planes transverse to said axis, said first disks comprising outwardly extending arms reaching toward said wall and defining openings located relatively outwardly from said axis;

a plurality of second disks mounted on said shaft and alternating with said first disks axially therealong whereby each first disk and a second disk axially spaced therefrom define a respective drying cell of adjustable axial length, said second disks being formed with openings communicating between said cells and located relatively inwardly with respect to said axis;

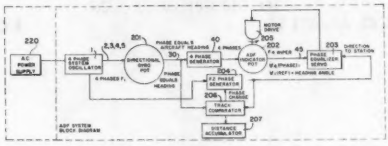
respective blades mounted on outer portions of said disks and positioned to scrape material from said wall and mix said material with said drying fluid as said material passes through said openings in said disks from cell to cell from said feeder means to said discharge means; and

respective rollers journaled on outer portions of at least some of said disks and having a predetermined spacing from said wall for comminuting material drying in said space to a predetermined particle size.

4,276,702
AIRCRAFT FLIGHT SIMULATING TRAINER

Joshua Horwitz, Magnolia, Mass., assignor to Pacer Systems, Inc., Burlington, Mass.

Division of Ser. No. 748,116, Dec. 6, 1976. This application Apr. 25, 1979, Ser. No. 33,073
Int. Cl.[3] G09B *9/08*
U.S. Cl. 434—47 15 Claims

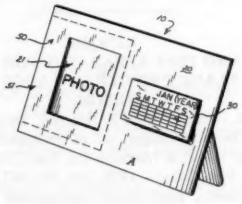


7. An aircraft flight simulator instrument trainer comprising a master system oscillator for producing separate oscillations at ninety degree spaced intervals, a master phase locked oscillator connected to the master system oscillator for dividing oscillations of the master system oscillator, a present divider connected to the master phase locked oscillator for dividing oscillations of the master phase locked oscillator, an accumulator means connected to the divider for counting oscillations and multiplexer means connected to the accumulator means for changing the accumulator means, and input means connected to the multiplexer means and for inputting simulated navigational quantities to the accumulator.

4,276,703
CALENDAR APPARATUS

Donald J. Brindley, 806 SE. Sharon Dr., Ankeny, Iowa 50021

Filed Dec. 12, 1979, Ser. No. 103,070
Int. Cl.[3] G09D *3/04*
U.S. Cl. 40—121 1 Claim



1. A collapsible display item comprising:

a self-supporting, rigid, one piece body having a face portion and a rear portion, said face portion and said rear portion having abutting surfaces adhesively secured to each other along the extreme top, bottom and one end thereof;

shaped aperture means disposed in said face portion, extending through said face portion to said rear portion for holding and displaying a picture;

pocket means formed by the other side of the face and rear portions for allowing the other end of the face and rear portions to be temporarily separated for selectively allowing a picture to pass between said other side of the face and rear portions to or from said aperture means;

a calendar disposed on said face portion, said calendar comprising a plurality of detachable sheets secured to said face portion, and each of said sheets having a different month imprinted on its face, and a promotional coupon imprinted on the rear side thereof;

said rear portion having means including four spaced straight slots disposed therein, for releasably securing a printed promotional item therein, two of said slots being parallel with respect to each other and perpendicular with respect to the other two slots;

a flap member depending from said upper rear portion and having a horizontal slot disposed therein; and

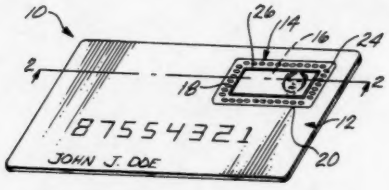
a lower rear portion having an U-shaped slot means disposed therein for forming a flap element, said flap element being configured to fit within the horizonal slot in said flap member.

4,276,704

RECORD BEARING ASSEMBLY FOR ENCAPSULATION OF A RECORD MEMBER, CAPSULE PART FOR A RECORD BEARING ASSEMBLY AND METHOD OF FABRICATION OF RECORD BEARING ASSEMBLY

Peter V. N. Heller, 3396 Calle La Veta, San Clemente, Calif. 92672

Filed Sep. 1, 1978, Ser. No. 938,975
Int. Cl.³ G09F *1/10*
U.S. Cl. 40—159 **45 Claims**



1. A record bearing assembly for encapsulating a planar record member comprising:

a thin substantially flat base member comprising an aperture therethrough;

a plastic capsule comprising as an integral part thereof

a thin substantially planar closed cavity for such a planar record member positioned within the perimeter of the aperture, first and second sides sandwiching the base member therebetween substantially completely around the capsule cavity,

a wall connected between the first and second sides and extending within the aperture of the base member completely around the perimeter of the cavity, and

a plurality of pegs integral with and extending between the first and second sides stitching through the base member at a plurality of locations substantially completely around the perimeter of the capsule cavity.

4,276,705

GRAPHICAL DISPLAY MEANS

William L. Barth, 1338 W. Vesta, Ontario, Calif. 91762, and Clifford E. Barth, 16633 Arrow Pines, Azusa, Calif. 91702

Continuation-in-part of Ser. No. 955,959, Oct. 30, 1978, abandoned. This application May 21, 1980, Ser. No. 151,810
Int. Cl.³ G09F *13/18*
U.S. Cl. 40—579 **6 Claims**

1. An internally-lighted display apparatus comprising:

enclosed housing means having an illumination source therein;

a relatively thin, laminar graphic display assembly forming a front cover for the housing means comprising a flexible outer layer of a metal foil impervious to light and a metal screen underlying said outer layer;

a plurality of light transmitting markers of clear plastic construction, each having a shank with a piercing tip at one end and an enlarged head at the opposite end;

said outer layer being a type of metal foil readily pierceable by light transmitting markers with pointed shanks through which light from the interior of said housing can be transmitted, and said metal screen being of suitable mesh size to receive the shanks of said markers and help hold the latter in place when they are positioned in penetrating relationship therewith;

and an outermost sheet, adapted to bear a design and readily penetrable by said markers, fastened in overlying relation-

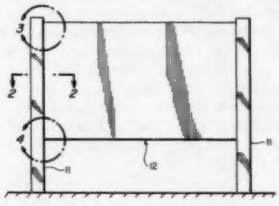
ship against said outer layer of metal foil as a display face for said apparatus; said illumination source is of a heat emitting character and said metal foil is of a type to stretch and tighten said outermost sheet under the influence of heat from said illumination source.

4,276,706

POST AND PANEL SIGN ASSEMBLY

Albert Q. Scott, 922 N. Dutton Ave., Santa Rosa, Calif. 95401

Filed Oct. 20, 1978, Ser. No. 953,171
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—607 **3 Claims**



1. In a sign assembly: an elongated post having a smooth outer surface, an elongated cleat mounted on the outer surface of the post and extending less than the full length of the post, a panel having a first side frame member slidably mounted on the cleat in interlocking engagement therewith and a second frame member abutting against one end of the cleat, and a retaining plate removably secured to the first frame member and abutting against the other end of the cleat.

4,276,707

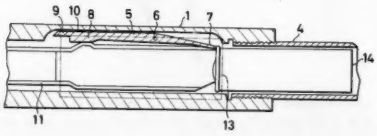
CARTRIDGE/CARRIER LOCKING DEVICE FOR AUTOMATIC GUN

Hisao Hayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-Ten, Tokyo, Japan

Filed Sep. 18, 1978, Ser. No. 943,353
Int. Cl.³ F41C *13/00*
U.S. Cl. 42—17 **1 Claim**

1. An automatic firearm comprising: a barrel having a breech end through which cartridges may be loaded into said barrel; a magazine from which cartridges may be supplied in

succession to said barrel; a breechblock movable between a first position closing said breech end of said barrel and a second position for permitting loading of a cartridge from said magazine into said barrel; a carrier mounted for pivotal movement between a first position for receiving a cartridge from said magazine and a second position for moving a received cartridge into loading position relative to said breech end of said barrel; a latch plate having a first end adjacent said magazine and a second end, said latch plate being pivotally mounted intermediate said first and said second ends for movement between a first and a second pivotal position, said first end of said latch plate operating to block removal of cartridges from said magazine when said latch plate is in said first pivotal position; spring means urging said latch plate toward said second pivotal position; first surface means on said breechblock engaging said second end of said latch plate to hold said latch plate in said first pivotal position against the force of said spring means when said breechblock is in its said first position; said breechblock being configured to release said engagement with said latch plate to permit said latch plate to move to said



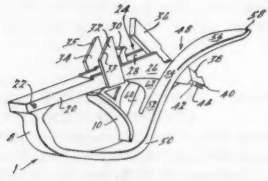
second pivotal position by operation of said spring means when said breechblock is in its second position; carrier engaging means on said second end of said latch plate engaging said carrier when said latch plate is in a position other than said second pivotal position to hold said carrier in said first position; means on said latch plate adapted to be engaged by a cartridge received on said carrier to effect movement of said latch plate against the force of said spring means out of said second position to release said carrier and to thereby permit said carrier to move to said second position to bring a received cartridge into position for loading into said barrel; second surface means on said breechblock engaging said second end of said latch plate when said breechblock is in a position intermediate said first and second positions thereof to permit said latch plate to move to a pivotal position intermediate said first and said second pivotal positions under the force of said spring means; and intermediate surface means on said breechblock extending in a slanted configuration between said first and said second surface means for engaging said second end of said latch plate as said second end moves between engagement with said first and said second surface means of said breechblock.

4,276,708

PISTOL RECEIVER ACTUATING MECHANISM

Marshall D. Chase, 75 E. Van Buren Rd., Alma, Mich. 48801

Filed Feb. 5, 1979, Ser. No. 9,605
Int. Cl.³ F41C *3/00*
U.S. Cl. 42—44 **10 Claims**



1. A trigger guard for use with a firearm having a trigger guard actuated mechanism, said trigger guard comprising: a generally horizontally extending base; a safety guard member integrally formed with said base and protectively extending in front of and below said base; a rearwardly and upwardly extending elongated lever member integrally formed with said safety member and adapted to be manipulated by the hand of the shooter; means for actuating said mechanism, and a web member extending integrally between a rearward portion of said base and said elongated lever member

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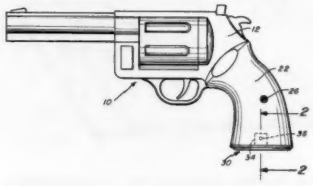
4,276,709

HANDGUN STOCK POMMEL

Robert Bross, Ballville Rd., Bolton, Mass. 01740

Filed Nov. 14, 1979, Ser. No. 94,002
Int. Cl.³ F41C *23/00*
U.S. Cl. 42—71 P **8 Claims**



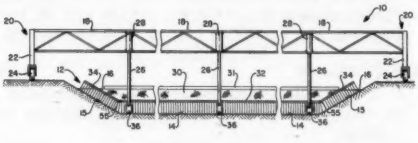
1. A pommel for mounting to stocks of a handgun, said pommel comprising a pommel plate having thereon a mounting boss extending from the inner face of said plate, said mounting boss having means for securing said pommel to said handgun stocks.

4,276,710

AQUACULTURE POND AND HARVESTER

Michael P. Yunker, 3906 Old Pali Rd., Honolulu, Hi. 96817, and David K. Barclay, P.O. Box 911, Kapaau, Hi. 96755

Filed Nov. 29, 1979, Ser. No. 98,640
Int. Cl.³ A01K *79/00*
U.S. Cl. 43—4 **12 Claims**



1. An aquaculture harvester, comprising:
an elongated truss maintained at each end thereof by a carriage;
a plurality of support arms depending from said truss;
scraper means connected to and extending between bottom sections of said support arms for making contacting engagement with a water bed; and
a net connected to and extending between said support arms, said net being operatively connected to said scraper means.

4,276,711
FISHING ROD WITH STRIKE SIGNALLING APPARATUS

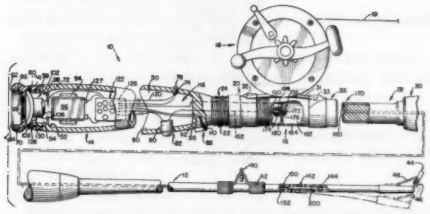
William R. Mathauser, Box 5, Sun Valley, Id. 83353

Continuation of Ser. No. 806,330, Jun. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 685,157, May 11, 1976, Pat. No. 4,051,616. This application Dec. 19, 1978, Ser. No. 970,971

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.³ A01K 97/12

U.S. Cl. 43—17 9 Claims



1. A strike alerting means for use in fishing, comprising:

a fishing rod having a handle and a fishing line and which flexes when a fish strikes a hook on said fishing line, said rod and handle each having a longitudinal hollow bore defined by an inside surface thereof;

an electronic circuit mounted within said fishing rod handle in said hollow bore to be protected from damage;

strike signalling means connected to said electronic circuit and controlled by said circuit to signal when a fish strikes said hook, said signalling means including a plurality of strain gages each mounted on said rod inside surface;

said strike signalling means being entirely located in said rod and attaching said rod to said electronic circuit to complete said circuit so that said strike signalling means is connected by said electronic circuit to a power source to be activated to signal a strike when said rod undergoes a predetermined amount of flexure due to said strike, means mounted on said fishing rod handle for adjusting said rod flexure sensing means to vary the sensitivity thereof, said rod flexure sensing means and the elements associated therewith being located within said rod to be protected from environmental conditions which may cause said sensing means to inconsistently sense said rod flexure.

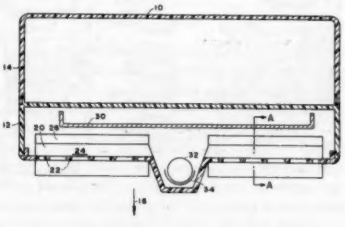
4,276,712
INSECT ELECTROCUTION APPARATUS

Meir Zeldov, Herzlia, and Mordechai Yavnieli, Ramat-Hasharom, both of Israel, assignors to Amcor, Ltd., Tel-Aviv, Israel

Filed Aug. 16, 1979, Ser. No. 67,231

Int. Cl.³ A01M 1/22

U.S. Cl. 43—112 7 Claims



1. Insect electrocution apparatus comprising:

a housing defining an outward facing direction and an inward facing direction;

an inner electrode disposed within said housing;

an array of composite members spaced in an outward facing direction with respect to said inner electrode, and adapted for entrance of insects between elements of said array,

said composite members each comprising an outward facing member fabricated from insulative material defining a safety guard and fixed thereto an inwardly facing conductor, defining an element of an outer electrode array, and

means for coupling said inner electrode and said outer electrode array across a high voltage source.

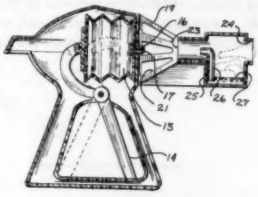
4,276,713
PERCOLATING BUBBLE GENERATOR

Scott C. Crosbie, 4349 Brookside Ave., Minneapolis, Minn. 55435

Filed Feb. 4, 1980, Ser. No. 117,946

Int. Cl.³ A63H 33/28

U.S. Cl. 46—8 5 Claims



1. A bubble generating apparatus comprising:

a hand holdable housing having a source of air under pressure;

a chamber mounted horizontally on the housing and having axially aligned, spaced-apart inlet and outlet openings of a first cross-sectional dimension and a lower portion for receiving liquids, the liquid receiving portion having an outlet for discharging bubbles into the interior of the chamber;

nozzle means of a substantially lesser cross-sectional dimension and being aligned with said inlet opening, said nozzle and said inlet and outlet openings being open to the ambient atmosphere around said chamber so that a stream of air from said nozzle is directed through said nozzle, said inlet opening, said chamber and said outlet opening; and

tube means running upwardly from the bottom of the liquid receiving portion of the chamber, and terminating with an open end facing said inlet opening, whereby a portion of the air stream is directed through the tube means into the fluid receiving portion of said chamber to cause formation of bubbles, which are subsequently drawn out of the chamber by the air stream exiting through said outlet opening.

4,276,714
DOLL INCLUDING MECHANISM FOR SUCKING ACTION AND SOUNDS

Judith Albert, Mill Neck, N.Y., and Janos Beny, Torrance, Calif., assignors to Ideal Toy Corporation, Hollis, N.Y.

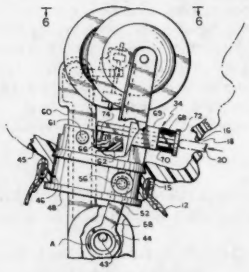
Filed Oct. 19, 1979, Ser. No. 86,603

Int. Cl.³ A63H 5/00

U.S. Cl. 46—118 10 Claims

1. A toy doll comprising, a body and a movable head thereon, said head having a mouth opening formed therein; drive means in said body for selectively oscillating said head in a forward and aft direction; said drive means including a neck block mounted in said head, rotary drive means in the doll's body, and pitman means drivingly engaged between said rotary drive means and neck block for oscillating the block in a forward and aft direction; locking means in said head for

blocking oscillation of said neck block under the influence of said rotary drive means, said locking means being responsive to the insertion of an object in the doll's mouth opening to release



said locking means, unblock movement of the neck block, and allow the drive means to oscillate said head; and means responsive to said oscillation of the doll's head for producing sounds.

4,276,715

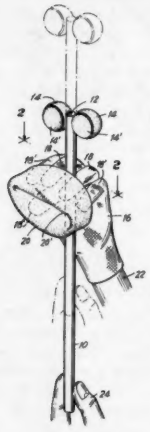
PUPPET

Robert D. Rogers, 11 Cornell Pl., New Rochelle, N.Y. 10804

Filed Feb. 25, 1980, Ser. No. 124,490

Int. Cl.³ A63H *3/14, 3/38, 3/36*

U.S. Cl. 46—154 **3 Claims**



1. A puppet structure for providing a plurality of facial configurations comprising, in combination, an elongated support pole, an eye part fixedly and rigidly attached at one end of said pole, a glove having five fingers including at least a pair of fingers straddling said support pole for up and down and rotative motion thereof and a flexible mouth part mounted at the ends of said five fingers and for retaining said support pole.

4,276,716

MULTI-STAGE ENERGY STORAGE DEVICE

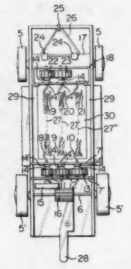
Kenichi Mabuchi, Matsudo, Japan, assignor to Mabuchi Motor Co, Ltd, Tokyo, Japan

Filed Feb. 14, 1979, Ser. No. 12,008

Claims priority, application Japan, Feb. 17, 1978, 53-17262; Feb. 17, 1978, 53-19257[U]; Feb. 18, 1978, 53-18026

Int. Cl.³ A63H *17/00;* F03G *1/00*

U.S. Cl. 46—206 **11 Claims**



1. A multi-stage energy storage toy car comprising a chassis frame; a plate that is slidably mounted on and movable with respect to one end of said chassis frame; a plurality of pairs of hooks mounted rotatably on said plate and on one end of said chassis frame whereby said hooks are arranged in spacedly opposed pairs; at least one elongated elastic member stretched in the length direction of said chassis frame between each pair of said hooks, each said elastic member being adapted to store energy when twisted about its own longitudinal axis; a tensioner for displacing said movable plate in one direction and for maintaining said movable plate in the displaced position, said tensioner being provided between said chassis frame and said movable plate; an energy transmitting mechanism for transmitting the elastic energy stored in said elastic members after the twisting thereof; and a power transmitting portion which is coupled to said hooks between which said elastic members are stretched, said energy transmitting mechanism being constructed so as to increase the driving torque when transmitting the energy stored in said elastic member located on one side of said car to said elastic member located on the other side of said car.

4,276,717

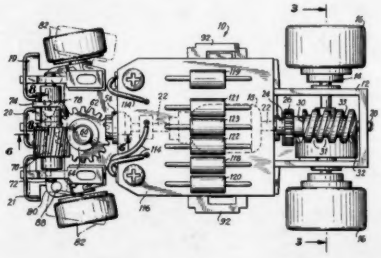
PERIODICALLY SWERVING TOY VEHICLE

Michael J. Zbriger, Bridgeport, Conn., and Anthony Passamenti, Wantagh, N.Y., assignors to Aurora Products Canada, Ltd., Rexdale, Canada

Filed Jan. 19, 1979, Ser. No. 4,952

Int. Cl.³ A63H *17/36, 17/00;* A63F *9/14*

U.S. Cl. 46—262 **11 Claims**



1. A miniature toy vehicle comprising:

a vehicle chassis;

a plurality of wheels mounted on said vehicle chassis for rotation in frictional contact with a surface, whereby said vehicle travels on said surface, a first portion of said plurality of wheels being pivotable for steering and a second portion of said plurality of wheels being non-pivotable and positioned in a longitudinal direction;

means for driving at least one wheel in said non-pivotable portion of said plurality of wheels to cause longitudinal motion of said vehicle on said surface;

means for pivoting at least one wheel in said pivotable portion of said wheels, said at least one pivotable wheel being pivoted about an axis not parallel to the rotational axis of said at least one pivotable wheel;

said means for pivoting at least one wheel in said pivotable portion of said wheels including:

a tie-bar connected to said at least one pivotable wheel;

a cam and a cam follower, said cam in contact with cam follower, said cam when rotating being contoured to cause said tie-bar to translate laterally in reciprocal motion whereby said pivotable wheel is pivoted alternately from left to right so as to produce a zig-zag path of travel for said vehicle;

means for rotating said cam, said means for rotating said cam being operatively connected with said means for driving said at least one wheel in said non-pivotable portion of wheels;

said operative connection between said non-pivotable portion of wheels and said rotating cam includes a snail gear driven when said at least one non-pivotable wheel is driven, said snail gear having one tooth of extended length, said tooth forming an open spiral around the axis of rotation of said snail gear;

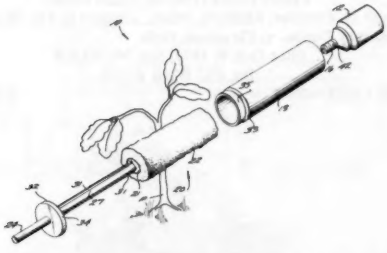
a spur gear having its axis of rotation transverse to the axis of rotation of said snail gear, said one tooth of said snail gear being interposed between two adjacent teeth of said spur gear, whereby rotation of said snail gear about its axis causes said spur gear to rotate.

4,276,718

HERBICIDE APPLICATION

John H. Keeton, Campbellsville; Lyle S. Keeton, and Eugene G. Keeton, both of Trenton, all of Ky., assignors to Keeton Enterprises, Inc., Campbellsville, Ky.

Filed Dec. 10, 1979, Ser. No. 101,567
Int. Cl.³ B05C *1/00*
U.S. Cl. 47—1.5 **19 Claims**



1. A liquid applicator device comprising an elongated container having first and second portions separated by a metering valve, said first portion containing a supply of liquid, and said second portion for receiving metered amounts of liquid from said first portion;

an elongated roller having fibrous covering means for receiving liquid from said container and for ultimately transferring the liquid to another object, and having a cross-sectional area, including said covering means, smaller than the inside cross-sectional area of said container second portion; said roller including a handle extending from one end thereof and valve operating means operatively connected to the other end thereof; and

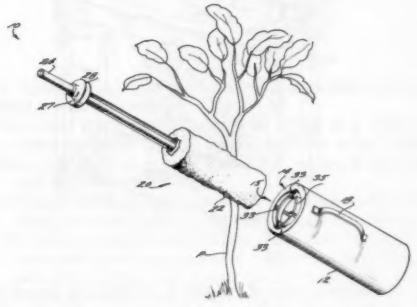
a valve actuator means operatively associated with said valve disposed between said container first and second portions, for engagement with said valve operating means, so that movement of said roller relative to at least one said portion of said container results in actuation of said valve to meter liquid from said first portion to said second portion.

4,276,719

HERBICIDE ROLLER APPLICATION

John H. Keeton, Campbellsville; Lyle S. Keeton, and Eugene G. Keeton, both of Trenton, all of Ky., assignors to Keeton Enterprises, Inc., Campbellsville, Ky.

Continuation-in-part of Ser. No. 101,567, Dec. 10, 1979. This application Feb. 1, 1980, Ser. No. 117,514
Int. Cl.³ B05C *1/00*
U.S. Cl. 47—1.5 **20 Claims**



1. A liquid applicator comprising

a container elongated along an axis and having a first, closed end, and a second end including means defining an opening therein;

a roller elongated along an axis and having fibrous covering means for receiving liquid from said container and for ultimately transferring the liquid to another object, and having a cross-sectional area, including said covering means, smaller than the inside cross-sectional area of said container and than said opening in said container second end; said roller including a handle extending from one end thereof;

means operatively associated with said roller for closing said opening in said container second end when said roller is in said container; and

means for mounting said roller within said container for relative rotation with respect to said container with the axes of the roller and container coincident.

4,276,720

PLANT WATERING MAT SYSTEM

William Lyon, 116 Myers Ave., Hicksville, Long Island, N.Y. 11801

Filed Sep. 15, 1978, Ser. No. 942,535
Int. Cl.³ A01G *27/00*
U.S. Cl. 47—39 **5 Claims**

1. A watering and humidifying system for potted plants comprising:

a tray having a bottom wall and side and end walls defining a reservoir for holding water throughout substantially the entire interior area of said tray,

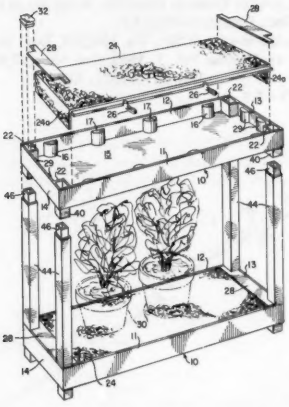
a platform for holding plant pots, means for mounting said platform to said tray for the lower surface of said platform to close off the major portion of said reservoir, the upper surface of said platform being substantially larger in sur-

face area than the bottom of any one pot to be held, said platform terminating short of each of said end walls to provide a space between said platform and each said end wall for providing communication with the reservoir to supply water thereto from the top of said tray through at least one of said spaces without removing said platform,

cover means for closing a part of each said space,

means in the portion of each said space left uncovered by said cover means for accepting and holding a stacking means to permit another tray to be stacked on said first named tray,

a watering mat of fabric material located on and covering



the major portion of the area of the upper surface of said platform, said platform and the tray formed to provide a space between an edge of the platform and one of the walls of the tray such that a portion of the mat extends into the reservoir to draw water from the reservoir by capillary action, the upper surface of said mat being uncovered and the water being conveyed to the entire surface area of the mat to provide water directly to the bottom of a pot placed on the mat and also to evaporate into the area surrounding any pot on the platform water from the portions of the mat left uncovered by pots to provide by the evaporation humidity to the foliage of any plant of a pot on the mat.

4,276,721

METHOD AND DEVICE FOR CONTROL OF TRANSLOCATION IN A STEM

Henry H. Turner, 2702 Techwood Dr., Columbus, Ga. 31906

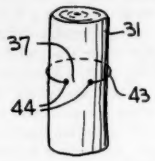
Continuation-in-part of Ser. No. 1,188, Jan. 5, 1979, Pat. No. 4,193,224, which is a continuation of Ser. No. 745,324, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 610,771, Sep. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 429,392, Sep. 28, 1973, abandoned. This application Oct. 26, 1979, Ser. No. 88,518

The portion of the term of this patent subsequent to Mar. 18, 1997, has been disclaimed.

Int. Cl.³ A01G *1/00*

U.S. Cl. 47—58 **48 Claims**

1. A method for control of translocation in a stem by restriction of growth comprising, maintaining a linear segment transversely at the surface of said stem at each of a plurality of levels, each said segment subtending an angle of not more than 180° about the axis of said stem, said linear segments being so positioned about the said axis as to form together an incomplete enclosure extending beyond one level, said enclosure being incomplete by virtue of there being a plurality of gaps or breaks in its limits, the number of said gaps corresponding to the number of said linear segments, so that said restriction of



growth occurs at each said level by the said linear segment thereat, said growth extending thereafter through said gaps.

4,276,722

TAP SHARPENER

Millo Bertini, 679 Garden St., Trumbull, Conn. 06611

Filed Jan. 29, 1980, Ser. No. 116,550

Int. Cl.³ B24B *19/00*

U.S. Cl. 51—225 **10 Claims**

1. An apparatus for sharpening a fluted tap, said apparatus comprising:

a base defining a base axis;

a support fixed on said base and pivotal thereon about a support axis inclined to said base axis;

a tap holder fixed on said support for joint rotation therewith about said support axis;

retaining means on said tap holder for securing a tap thereon with the central axis of said tap extending parallel to said support axis;

slide means between said holder and said support for displacement of said holder on said support in a direction passing perpendicularly through said support axis and through the central tap axis of a tap secured by said retaining means in said holder.

4,276,723

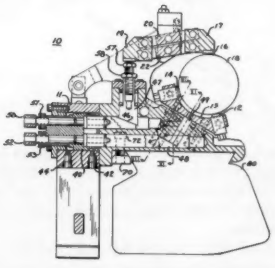
COMPENSATING STEADYREST

Roger H. Fournier, Millbury, Mass., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 9, 1979, Ser. No. 82,519

Int. Cl.³ B24B *41/06*

U.S. Cl. 51—238 S **8 Claims**



1. A steadyrest for supporting various diameter workpieces for rotation about a common centerline comprising:

a main body member;

three flat contact shoes each movable with respect to said main body member for engaging along a line contact and supporting a workpiece;

pivot means pivotally connected to said main body member for supporting an upper one of said three contact shoes and being operable to pivot the supported contact shoe between a load position, remote from the work area, and an operation position, in the work area, for engaging the workpiece;

a hydraulic cylinder formed in said main body member;

a piston disposed in said hydraulic cylinder and being movable in response to the application of pressurized hydraulic fluid;

a first wedge connected to said piston for movement therewith;

a second wedge connected to said piston for movement therewith;

a first wedge follower for following the movement of said first wedge;

a second wedge follower for following the movement of said second wedge;

upper contact shoe positioning means disposed between said upper one of said contact shoes and said first wedge for positioning said upper contact shoe in response to movement of said first wedge;

a lower contact shoe support supporting two of said three contact shoes;

lower contact shoe positioning means disposed between said lower contact shoes and said lower wedge follower for positioning said lower contact shoes as said lower wedge is moved;

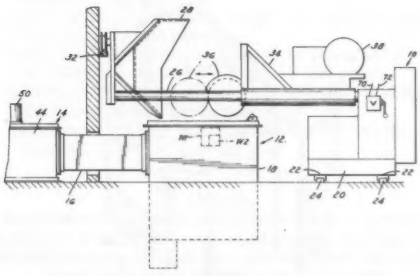
said upper and lower contact shoe positioning means operable when said pivot means is in the operating position for simultaneously and at the same rate moving the line contact of each of said three contact shoes into engagement with the workpiece for supporting workpieces of various diameter for rotation about the common centerline.

4,276,724

WATER TANK FOR SUBMERGED GRINDING SYSTEM

John L. King, Jr., Owosso, Mich., assignor to MWA Company, Owosso, Mich.

Filed Oct. 1, 1979, Ser. No. 80,491
Int. Cl.³ B24B *55/02*
U.S. Cl. 51—266 **4 Claims**



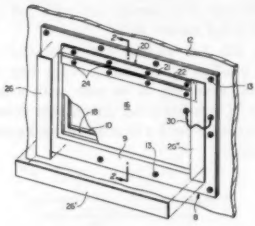
1. Apparatus for submerged grinding of ferrous or nonferrous metals comprising a work tank adapted to contain a liquid, means for supporting a workpiece in said work tank, and means for controlling the level of liquid in said work tank, said liquid level controlling means comprising a ballast tank, a duct connecting said tanks so as to equalize the level of liquid in the tanks, means for raising and lowering the level of liquid in said ballast tank to correspondingly raise and lower the level of liquid in said work tank comprising a liquid displacement member, means supporting said displacement member in said ballast tank for up and down movement, and power means for moving said displacement member up and down.

4,276,725

METHOD AND APPARATUS FOR RELEASING AN ELEVATED PRESSURE DEVELOPED BEHIND A WALL

John E. Ash, P.O. Box 3, Benicia, Calif. 94510

Filed Jul. 12, 1979, Ser. No. 56,906
Int. Cl.³ E04H *9/00*
U.S. Cl. 52—1 **17 Claims**



1. Apparatus for releasing an elevated pressure developed behind a wall, comprising:

(a) a rigid frame mountable over an orifice in a wall, said frame having an opening that corresponds to the orifice;

(b) a rigid panel sized to fit within the opening in the frame and to cover the orifice;

(c) hinge means pivotally mounting the panel to the frame along one margin and in registration with the orifice;

(d) means, attachable between the frame and the panel, for releasably securing the panel to the frame so that the panel and frame are secured against fluid leakage when an elevated pressure is not present and so that, if an elevated pressure is developed, the panel will release and pivot with respect to the frame using the hinge, thereby releasing the elevated pressure; and

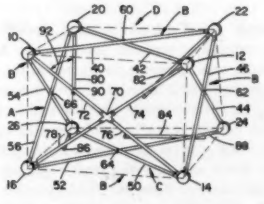
(e) a margin forming part of said panel and extending around the opening in the latter, said margin having a non-stick surface so that foreign materials cannot bond the panel to the frame and prevent pivoting of the panel during periods of elevated pressure.

4,276,726

COLLAPSABLE, ARTICULATED WALL STRUCTURE

David L. Derus, 1084 Quilliams Rd., Cleveland Heights, Ohio 44121

Filed Dec. 17, 1979, Ser. No. 104,395
Int. Cl.³ E04H *12/18*
U.S. Cl. 52—109 **28 Claims**



1. A collapsable, articulated structural section which is moveable between an erected configuration and a collapsed configuration, said structure comprising:

a first plurality of pivot means disposed to be substantially in a first plane in said erected configuration and to be substantially adjacent each other in said collapsed configuration;

a second plurality of pivot means disposed to be substantially in a second plane in said erected configuration and to be substantially adjacent each other in said collapsed configuration, said second plane being substantially parallel to said first plane;

a plurality of pivotally interconnected side links for connecting said first plurality of pivot means with said second plurality of pivot means, each of said links being connected with one of said first plurality of pivot means and one of said second plurality of pivot means;

a face pivot means;

a plurality of face links, each of said face links connected with said face pivot means and with one of said first plurality of pivot means; and

a locking link for locking the structural section in said erected configuration, said locking link being pivotally connected near one of its ends with a first one of said plurality of face links and operatively connected near the other of its ends with a first one of said second plurality of pivot means.

4,276,727

TELESCOPIC JIB FOR LOAD-HANDLING DEVICE

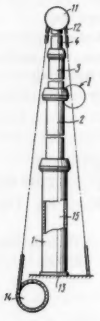
Viktor M. Salomatin, Kastanaevskaya ulitsa, 44, kv. 58; Petr N. Belyanin, ulitsa Marshala Tukhachevskogo, 23, korpus 2, kv. 186, and Vladimir I. Pestrikov, Profsojuznaya ulitsa, 59/25, korpus 2, kv. 79, all of Moscow, U.S.S.R.

Filed Sep. 5, 1978, Ser. No. 940,152

Claims priority, application U.S.S.R., Dec. 6, 1977, 2546701

Int. Cl.³ B66C *23/06*

U.S. Cl. 52—115 **1 Claim**



1. A telescopic jib of a load-handling device, comprising: telescopically extensible sections made in the form of fluid cylinders; annular sealing means positioned at the end portions of said sections, each said annular sealing means including a sleeve defining an annular space with the end face of the fluid cylinder of the greater diameter and the side surface of the fluid cylinder of the smaller diameter, a floating ring mounted in said annular space and carrying seals engaging the external periphery of said smaller-diameter fluid cylinder and the end faces of said floating ring; annular grooves made coaxially in the external peripheral surface at the end of each fluid cylinder and in the end face of the respective one of said sleeves; a support ring accommodated in each said pair of annular grooves; means for governing the motion of said sections, including a rope-and-sheave system having at least two runs symmetrically extending with respect of the longitudinal axis of said jib.

4,276,728

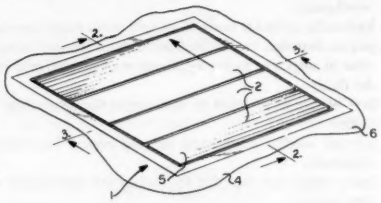
DIRT REMOVING GRID SYSTEM FOR FLOORS

Claude P. Balzer, and Edward M. Corman, both of Wichita, Kans., assignors to Balco, Inc., Wichita, Kans.

Filed Sep. 20, 1979, Ser. No. 77,290

Int. Cl.³ E04F *11/16, 19/10*; A47L *23/24*

U.S. Cl. 52—177 **12 Claims**



1. A floor grid for use in trafficways for removing debris from traffic passing thereover, said grid comprising:

(a) support means below a surface of and connected to said trafficway;

(b) a plurality of parallel spaced transverse tread rails supported by said support means and having an upper tread surface generally flush with said trafficway surface and a base; said tread rails allowing the debris deposited thereon to pass therebetween;

(c) a plurality of parallel traverse spacer bars each having a top and positioned immediately beneath said tread rails, said tread rails crossing said spacer bars at a plurality of locations; and

(d) locking means positioned at each said location for independently securing together said tread rails and said spacer bars and for urging said bases against said tops of said spacer bars.

4,276,729

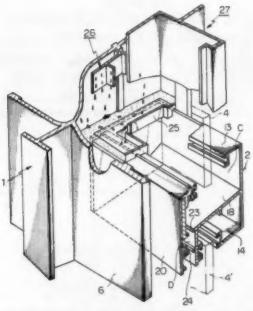
FLASHING CONSTRUCTION FOR A CURTAIN WALL

Yoshinobu Shiga; Ryusuke Kage, and Masakatsu Iwata, all of Tokyo, Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 65,285

Int. Cl.³ E06B *7/14*

U.S. Cl. 52—209 **10 Claims**



1. A flashing construction for a curtain wall having a plurality of vertical mullions disposed parallel to each other at a predetermined distance and panels being mounted between adjacent mullions, said flashing construction comprising:

a vertical mullion provided with a mounting groove at each side thereof for receiving one side portion on the panel;

an enclosed vertical space being formed between said mounting groove and the side portion of the panel, said

vertical space being extended in the longitudinal direction of the mullion, and said vertical space being connected to the open air outside the mullion;

an extra bead for the mullion, said extra bead being disposed in said mounting groove at the outermost position therein, so as to form a narrower mounting groove therebetween for receiving another side portion of the panel;

another enclosed vertical spaced formed between said narrower groove and the other side portion of the panel, said other vertical space being extended in the longitudinal direction of the mullion, and said extra bead being provided with intake ports, whereby said other vertical space is connected to the open air outside the mullion.

4,276,730

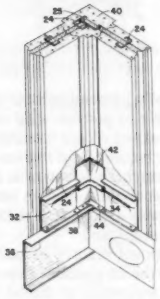
BUILDING WALL CONSTRUCTION

David M. Lewis, 7 McNear Dr., San Rafael, Calif. 94901

Filed Jul. 2, 1979, Ser. No. 54,305

Int. Cl.³ E04B *1/62;* E04C *2/52*

U.S. Cl. 52—221 **4 Claims**



1. Wall structure modules comprising:

a plurality of narrow, substantially ceiling high panels of lightweight concrete;

tongue and groove configurations along opposite sides of said panels conditioning them to be nested together in juxtaposition;

a full height load bearing steel "c" stud embedded in certain of said panels;

a cap channel adapted to fit over and along the tops of a plurality of nested panels;

means for securing said cap members to the load bearing studs in said nested panels;

means forming a horizontal raceway for piping and electrical conduits across the lower ends of said panels;

an electric outlet box in at least one of said panels opening to the interior surface thereof; and

a duct depending from said outlet box and opening into said raceway.

4,276,731

SUPPORTING RIB ARRANGEMENT FOR A LOWER CEILING WHICH IS TO BE SUSPENDED BENEATH A STRUCTURE-FIXED CEILING AND METHOD OF USING SUCH SUPPORTING RIB ARRANGEMENT

Aldo Henggeler, Haldenstrasse 12, Luzern, and Roland Crottaz, Seestrasse 89, Hergiswil, both of Switzerland

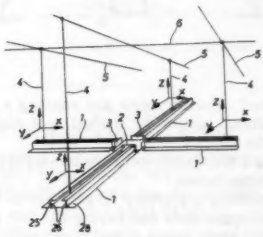
Continuation-in-part of Ser. No. 520,729, Nov. 4, 1974, abandoned. This application Sep. 24, 1976, Ser. No. 726,306

Claims priority, application Switzerland, Nov. 15, 1973, 16052/73

Int. Cl.³ E04B *5/52*

U.S. Cl. 52—484 **4 Claims**

1. A support rib arrangement for a lower ceiling which is to be suspended beneath a structure-fixed ceiling, comprising support profile members for supporting ceiling components of the lower ceiling, said support profile members being arranged in a grid arrangement with oppositely situated support profile members confronting one another at their ends at node points, suspension components which are connected in such a manner with the support rib arrangement and the structure-fixed ceiling respectively, that they render possible limited displacement of the support rib arrangement relative to the structure-fixed ceiling for tolerance compensation, said suspension components being connected with at least given ones of the support profile members at a spacing from the node points, and means for permitting each individual suspension component to be arranged to be adjustably movable between the structure-fixed ceiling and the support rib arrangement in three coordinate



directions independently of the remaining suspension components, means for providing an additional adjustment possibility for the support profile members for selectively adjusting the position thereof in their lengthwise extending direction, each support profile member being movable between two neighboring node points through a predetermined tolerance range, said adjustably movable means for said suspension components and said additional adjustment means enabling each said support profile member to be adjustably movable within said tolerance range at one node point without affecting the other neighboring node point, said additional adjustment means including an angle rail connected to each of said suspension components, said support profile members having confronting angle legs forming lengthwise slots in said profile members for slidably receiving said angle rail.

4,276,732

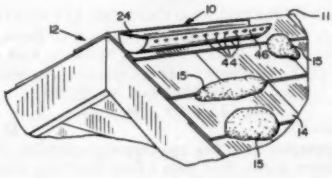
DEVICE FOR KILLING MOSS

James W. Nielsen, Newport, Oreg., assignor to Sharon G. Nielsen, Newport, Oreg.

Filed Aug. 24, 1979, Ser. No. 69,291

Int. Cl.³ B27K *3/22*

U.S. Cl. 52—517 **21 Claims**

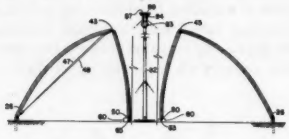


1. A device for killing moss on roofs, comprising a trough for positioning along a rooftop to receive and pool water; said trough including at least two elemental metals operable to form a biocidal electrolyte in the presence of water.

4,276,733
METHOD OF CONSTRUCTING AND ERECTING A DOME-SHAPED STRUCTURE

William L. Casper, Lafayette; Michael A. Jordon, Oakland; Craig S. Caulkins, Pleasant Hill, and Robert G. Miller, San Mateo, all of Calif., assignors to Liftech Consultants, Inc., Oakland, Calif.

Filed Jul. 25, 1979, Ser. No. 60,295
Int. Cl.[3] E04B *1/32;* E04G *21/00*
U.S. Cl. 52—745 9 Claims



1. A method of constructing and erecting a dome-shaped structure without temporary internal roof high scaffolding comprising the steps of:

a. installing a foundation including a first portion of a foundation hinge means;

b. pre-fabricating a plurality of base panels having lower ends and upper ends and having the first portion of an inter-panel hinge means at said upper ends and including generally horizontal strut members at said upper ends;

c. fabricating said base panels with a second portion of said foundation hinge means at said lower ends;

d. pivotally attaching said lower ends of said base panels to said foundation at said foundation hinge means;

e. pre-fabricating a plurality of upper panels having lower ends and upper ends and having the second portion of said inter-panel hinge means at said lower ends;

f. hingedly connecting said lower ends of each of said upper panels to said upper ends of each of said base panels;

g. pivotally lifting in a one at a time sequence each of said base panels to their final position and simultaneously raising the lower ends of said upper panels while said upper ends of said upper panels slide away from the center of said dome and remain at a lower elevation to temporarily shore said base panels;

h. connecting said strut of each of said base panels forming a temporary mid-compression ring at the upper ends of said base panels causing said base members to form a free standing immovable structure;

i. pivotally and sequentially lifting diametrically opposed pairs of said upper panels to their final positions about said inter-panel hinge means;

j. attaching said upper ends of said upper panels to one another; and

k. securing each of said base panels to said upper panels to rigidify said inter-panel hinge means forming a plurality of unitary acting upper panels and lower panels.

4,276,734
ROTARY FILLING AND CAPPING APPARATUS

Robert J. de Fasselle, Kirtland, Ohio; Richard D. Baron, Indian Rocks Beach, and James E. Nottke, Seminole, both of Fla., assignors to Lykes Pasco Packing Company, Clearwater, Fla.

Filed Apr. 16, 1979, Ser. No. 30,370
Int. Cl.[3] B65B *3/04, 7/28*
U.S. Cl. 53—77 13 Claims

1. An apparatus for filling and capping a plurality of stackable containers with a fluid from a fluid reservoir, comprising in combination:

a rotary table having a plurality of container receiving means disposed about said rotary table;

a container magazine disposed at a first position relative to said rotary table;

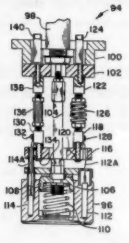
container transfer means for transferring a single one of the plurality of containers from said container magazine to said container receiving means of said rotary table;

a filling head disposed at a second position relative to said rotary table;

pump means connecting the fluid reservoir to said filling head for filling a container disposed on said rotary table with the fluid from the fluid reservoir;

a lid magazine in a third position disposed adjacent a container aperture in said rotary table;

lid transfer means comprising a rotatable vacuum arm for receiving a lid from said lid magazine and rotating about



an axis substantially perpendicular to the axis of rotation of said rotary table to position a lid upon the filled container, the terminal end of said rotatable arm comprising a vacuum head for holding a lid thereon;

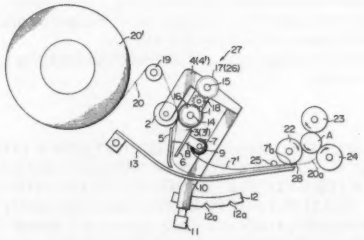
means for linearly moving said rotatable arm relative to said lid magazine whereby said vacuum head is linearly movable on said rotatable arm relative to the rotational axis of said lid transfer means; and

a mass slidably disposed relative to said vacuum head for applying force to the lid positioned upon the container for enabling proper separation of the lid from said vacuum head.

4,276,735
APPARATUS FOR GUIDING WRAPPING PAPER IN COIN WRAPPING MACHINE

Yorizo Miyazaki, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1979, Ser. No. 92,105
Claims priority, application Japan, Nov. 8, 1978, 53-154386[U]
Int. Cl.[3] B65B *11/04*
U.S. Cl. 53—212 8 Claims



1. In a coin wrapping machine including a set of rollers for wrapping a stack of coins in a selected length of sheet of wrapping paper, means for drawing the sheet from a roll of wrapping paper and for forwarding the sheet to the rollers, a cutter for cutting the forwarded wrapping paper into a selected length of sheet, and means for movably mounting the cutter so that an initial position of the cutter is adjustable with respect to the rollers, an apparatus for guiding the wrapping paper from

the cutter to the rollers comprising: a first guide member extending between a point near said cutter and a point near said rollers for guiding the wrapping paper from said cutter to said rollers; a second guide member comprising a single extensible and contractible member extending along and spaced from said first guide member for guiding, in cooperation with said first guide member, the wrapping paper, said second guide member having one end portion thereof fixed near one of said set of rollers; and means for mounting the other end portion of said second guide member on said means for movably mounting the cutter that the location of the other end portion is changed when the initial position of said cutter is changed whereby the other end portion of said second guide member is closely spaced from the cutter in all positions of the cutter.

4,276,736

PROCESS AND APPARATUS FOR DOING UP SHEET MATERIAL WITH LABEL TAPES

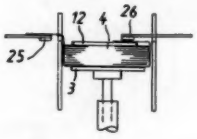
Markus Haberstroh, Planegg, and Herbert Bernardi, Haag, both of Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Jul. 24, 1979, Ser. No. 60,140

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835308

Int. Cl.³ B65B *13/06, 27/08*

U.S. Cl. 53—399 **24 Claims**



1. A process for banding a stack of thin material sheets with a sealable tape, said sheets being delivered in seriatim, said method comprising the steps of:

placing a predetermined length of tape on a table constrained for movement only in the direction normal to the face of the stack;

placing the sheets with their faces on the table and one of their edges against a plate adjacent and lying normal to the table to form a stack from the sheets;

placing the plate on top of the stack;

moving the table, stack, and plate in a direction normal to the face of the stack for applying the tape to the stack;

wrapping the tape around the stack and plate with the ends thereof overlapping;

sealing the ends of the tape; and

removing the stack from the table and plate.

4,276,737

VEGETATION CUTTER

Brian C. R. Henning, Hayes, England, assignor to Black & Decker, Inc., Newark, Del.

Filed Oct. 3, 1979, Ser. No. 81,429

Int. Cl.³ A01D *35/26*

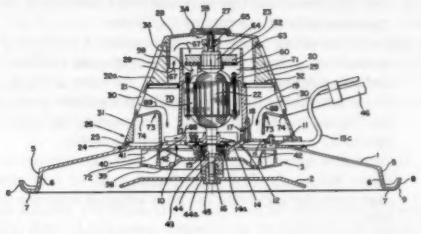
U.S. Cl. 56—12.8 **16 Claims**

1. An air cushion supported vegetation cutter comprising:

a casing having an opening therein; an impeller housed in sid casing for drawing a flow of air through said opening to create an air cushion in conjunction with said casing;

a motor for driving said impeller; and

a support structure for supporting said motor and defining a duct for the flow of cooling air over said motor, said duct having cooling air outlet means located upstream in the air flow to said opening whereby said motor cooling air combines with and forms part of the air drawn by said



impeller before the combined air is drawn through said opening.

4,276,738

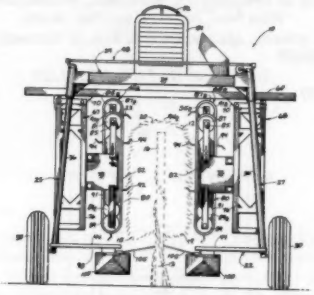
HOP PICKING MACHINE

Dominick Ferraro, Walla Walla, Wash., assignor to Chisholm-Ryder Co., Inc., Niagara Falls, N.Y.

Filed May 1, 1980, Ser. No. 145,868

Int. Cl.³ A01D *46/02*

U.S. Cl. 56—130 **7 Claims**



1. A hop picking machine for harvesting hops from a row of hop vines entrained over a low profile trellis wherein the trellis height may be less than the full straightened length of the vines, said machine comprising:

an inverted "U" shaped mobile frame having a longitudinal passageway therethrough to enable the mobile frame to straddle the trellis and move longitudinally along the row;

said frame having an overhead frame structure spaced above the ground surface a distance greater than the full straightened length of a hop vine, to extend transversely over the trellis with spaced leg frame structures that extend downward from the overhead frame structure to ground engaging wheel assemblies;

a first pair of hop picking conveyors spaced apart transversely on the frame, each having an inner vertically oriented picking flight continuously movable in a downward direction from a top elevation substantially equal to the height of the trellis on opposite sides of the row of hop vines;

a first combing finger assembly mounted on each of the first hop picking conveyors for engaging the hop vines and stripping hops downwardly from the vines as the finger assemblies move downwardly along their inner picking flights;

a second pair of hop picking conveyors spaced apart transversely on the frame and longitudinally spaced from the first pair of hop picking conveyors, each having a second

inner vertically oriented picking flight continuously movable in an upward direction from a top elevation substantially equal in height to the full, straightened length of a hop vine above the top elevation of the first conveyors on opposite sides of the row of hop vines;

a second combing finger assembly mounted on each of the second hop picking conveyors for engaging the hop vines and stripping hops upwardly from the vines as the second finger assemblies move upwardly along their inner picking flights, and for lifting and straightening the hop vines upwardly to their full length over the trellis;

transversely spaced longitudinal receiving conveyors on the frame below the first and second pairs of hop picking conveyors for receiving the hops stripped from the vines; and

drive means operatively connected to the first and second hop picking conveyors, the receiving conveyors, and the wheel assemblies for (a) moving the mobile frame along a row; (b) moving the first and second combing finger assemblies with their respective picking flights to move in opposite directions and strip hops from the vines; and (c) operating the receiving conveyors to remove the stripped hops from below the picking conveyors.

4,276,739

ELECTRONICALLY CONTROLLED SYSTEM FOR MAKING A MULTIPLY EFFECT YARN

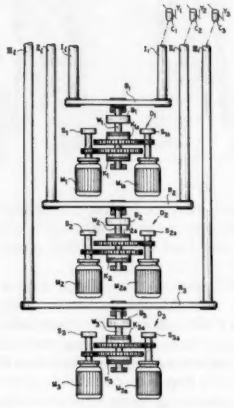
Gerhard Kempf, and Albert Kunz, both of Arbon, Switzerland, assignors to Evolution SA, Rorschach, Switzerland

Filed Nov. 14, 1979, Ser. No. 94,062

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849567

Int. Cl.³ D01H *1/30, 1/22, 1/26*

U.S. Cl. 57—91 **14 Claims**



1. A system for making a multi-ply yarn, said system comprising:

a yarn-winding body;

a pair of separate feed means each including

a strand-feed element for engaging and advancing a respective strand to said body, and

a pair of separate variable-speed electric motors operable at different motor speeds and alternately connectable to the respective element for driving same at a respective feed speed related directly to the respective motor speed;

control means for electrically varying said motor speed of said motors independently of one another and for alternately connecting the motors of each feed means to the respective feed element for feeding each of said strand to said body at either of the two respective feed speeds; and

means for winding up said strands on said body to form a multiply yarn.

4,276,740

SELF-TWISTED YARN AND METHOD AND APPARATUS FOR PRODUCING IT

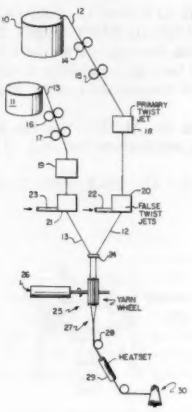
Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to WWG Industries, Inc., Rome, Ga.

Continuation-in-part of Ser. No. 844,616, Oct. 25, 1977, Pat. No. 4,215,642, which is a continuation-in-part of Ser. No. 755,671, Dec. 30, 1976, Pat. No. 4,074,511. This application Feb. 16, 1979, Ser. No. 12,771

The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.

Int. Cl.³ D01H *5/28, 7/90, 7/92;* **D02G** *3/26*

U.S. Cl. 57—205 **13 Claims**



1. Apparatus for forming a self-twist plural strand yarn from at least two single strands, comprising, means for moving each of said single strands longitudinally, means for twisting said single strands individually during their longitudinal movement to form twisted single strands each having longitudinally spaced sections of S-twist and Z-twist separated by nodes at which the direction of twist reverses, joining means for connecting said twisted single strands to each other at longitudinally spaced strand connections between which both strands twist in a same direction, the strand connections preventing relative rotation of said strands about their own axes at the strand connections, and a longitudinally movable rotation preventer located adjacent to said strand connections to prevent rotation of said strand connections, said rotation preventer being movable with the strands to permit the twist in the moving twisted single strands to become redistributed between each pair of strand connections, means for separating the strands from the rotation preventer after the twists are redistributed to permit the strand connections to rotate and enable the strands to twist together to form a self-twist plural strand yarn.

6. A method of forming a self-twist plural strand yarn from at least two single strands, comprising the steps of, moving each of said single strands longitudinally, twisting said single strands individually during their longitudinal movement to form twisted single strands each having longitudinally spaced sections of S-twist and Z-twist separated by nodes at which the direction of twist reverses, preventing rotation of said strands during their longitudinal movement at points which move longitudinally with the strands and between which both strands twist in a same direction, permitting the twist in the strands to become redistributed longitudinally between each pair of points, and releasing the strands after the twists are

redistributed to permit the strands to rotate together at said points and twist together to form a self-twist plural strand yarn.

4,276,741

METHOD AND APPARATUS FOR START-SPINNING A THREAD ON AN OPEN-END SPINNING UNIT

Fritz Stahlecker, Josef-Neidhart-Str. 18, D 7341 Bad Ueberkingen, and Dietrich Zilian, Sussen, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of Sussen, Fed. Rep. of Germany

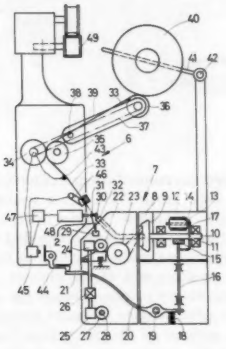
Continuation of Ser. No. 493,158, Jul. 30, 1974, abandoned. This application Aug. 16, 1978, Ser. No. 933,985

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1973, 2341528

The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.

Int. Cl.³ D01H *15/02*

U.S. Cl. 57—263 **28 Claims**



1. Apparatus for yarn piecing in an open-end spinning assembly comprising:

fibre feeding means for supplying fibre to a spinning rotor of said spinning assembly to form a fibre ring in said rotor, rotor decelerating means for decelerating the speed of the rotor from an operational speed,

piecing means including means for introducing a yarn end back into said spinning rotor to be pieced together with the fibre ring formed in said spinning rotor from said fibre,

piecing control means for controlling the timing of the introduction of said yarn back into said spinning rotor to occur during acceleration of said spinning rotor from said decelerated condition toward its operating spinning speed and before said spinning rotor reaches its operating spinning speed,

and feed control means for controlling the fibre feeding means separately from the control of the spinning rotor speed to vary the supply of fibre to said spinning rotor as said spinning rotor is accelerated during the piecing operation to correlate the fibre feeding speed to the speed of the spinning rotor during piecing as said spinning rotor is accelerated.

11. Method for yarn piecing in an open-end spinning assembly comprising:

supplying sliver to a spinning rotor of said spinning assembly by means of fibre feeding means to form a fibre ring in said rotor,

decelerating the speed of the spinning rotor to a decelerated condition with a lower speed than the spinning rotor operating speed,

introducing a yarn end back into said spinning rotor to be pieced together with the fibre ring formed in said spinning rotor from said fibre, utilizing piecing means,

controlling the timing of the introduction of said yarn back into said spinning rotor to occur during acceleration of said spinning rotor from its decelerated condition toward its operating spinning speed and before said spinning rotor reaches its operating spinning speed, by means of piecing control means,

and controlling the fibre feeding means with feed control means separately from the control of the spinning rotor speed to vary the supply of fibre to said spinning rotor as said spinning rotor is accelerated during the piecing operation to correlate the fibre feeding speed to the speed of the spinning rotor during piecing as said spinning rotor is accelerated.

4,276,742

THREAD-JOINING DEVICE

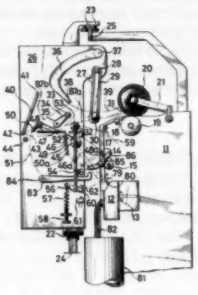
Hans Raasch, and Hans Grecksch, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst and Co., Monchen-Gladbach, Fed. Rep. of Germany

Continuation of Ser. No. 885,563, Mar. 13, 1978, abandoned. This application Sep. 27, 1979, Ser. No. 79,545

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711554

Int. Cl.³ D01H *15/02*

U.S. Cl. 57—263 **1 Claim**



1. Automatic yarn piecing machine for joining a thread to be returned from a take-up coil to a spinning rotor of an open end spinning machine having a delivery tube and a pair of delivery rollers for delivering spun thread from the spinning rotor, comprising means disposed at an upper location of the automatic yarn piecing machine in the vicinity of the take-up coil for locating and sucking a thread end on the take-up coil, and thread regulator means for seizing the thread end from said locating and sucking means, said thread regulator means being movable from said upper location to a position below the pair of delivery rollers below said upper position at an end of the delivery tube, said thread regulator means having a thread clamp including a roller pair, and a motor for driving at least one of the rollers of said roller pair in direction in which the thread is returned.

4,276,743

FUEL CONTROL SYSTEM

Charles H. LaGrone, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 743,387, Nov. 19, 1976, abandoned. This application Jan. 31, 1979, Ser. No. 8,027

Int. Cl.³ F02C *9/32*

U.S. Cl. 60—39.14 R **22 Claims**

1. In combination with a gas turbine engine fuel delivery system:

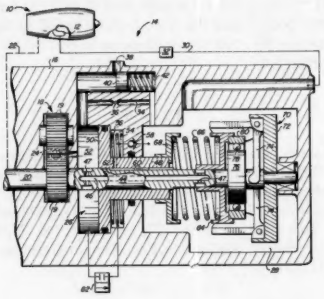
metering means for adjusting the rate of fuel flow delivered to said engine;

governor means responsive to engine speed for exerting a first force on said metering means in relation to engine speed;

biasing means for exerting a second, opposing force on said metering means;

time sensing means for sensing the elapsed time of a preselected portion of engine operation, said time sensing means including mechanism rotatably driven by the engine, and means for sensing the cumulative number of revolutions of said mechanism during said preselected portion of engine operation; and

means responsive to said time sensing means for increasing said second force as a predetermined function of said elapsed time to accelerate said engine.

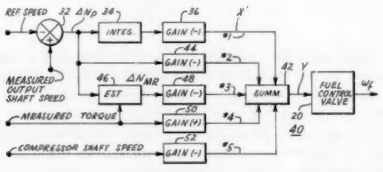


4,276,744

CONTROL SYSTEM FOR GAS TURBINE ENGINE

Alan D. Pisano, Chelsea, Mass., assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 19, 1979, Ser. No. 76,890
Int. Cl.³ F02C *3/10, 9/28*
U.S. Cl. 60—39.16 R **6 Claims**



1. In combination with a gas turbine engine having first drive shaft means coupled to engine compressor means and second drive shaft means adapted to provide rotational motion to at least one airfoil, a control system for controlling the rotational speed of the second drive shaft means, the control system being of the type including means for developing a first signal representative of a desired rotational speed of the second drive shaft means and a second signal representative of the actual rotational speed of the second drive shaft means, means for developing an error signal representative of the difference between said first and second signals, integrator means for integrating the error signal, first gain means for providing a desired gain to the integrated error signal, the integrated error signal comprising a control signal, and including a fuel valve control means responsive to the control signal for controlling the passage of fuel to the engine, wherein the control system further comprises:

(a) means for developing a third signal representative of the rotational speed of said first drive shaft means;

(b) means for developing a fourth signal representative of the torque provided by said second drive shaft means;

(c) signal processing means coupled to receive the error signal, said third and fourth signals and to develop a plurality of intermediate signals therefrom; and

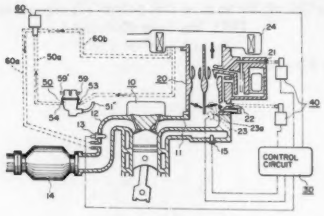
(d) summing means coupled to receive said plurality of intermediate signals and the output of the first gain means and developing an output signal, said output signal comprising the control signal to said fuel valve control means for controlling the passage of fuel to said engine.

4,276,745

EXHAUST GAS CONTROL APPARATUS

Shigetaka Takada, Ohbu; Kazumichi Naruse, and Yukihiro Watanabe, both of Nagoya, all of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Jul. 12, 1979, Ser. No. 56,759
Int. Cl.³ F01N *3/10*
U.S. Cl. 60—276 **9 Claims**



1. In an exhaust gas control apparatus having an exhaust gas sensor means, disposed in the exhaust system of an internal combustion engine having an engine shaft, for detecting the air-fuel ratio of an air-fuel mixture supplied to the engine, a carburetor supplying an air-fuel mixture to the engine having main and slow systems and an air cleaner upstream of the carburetor, temperature detector means for detecting a non-warm condition of the engine, actuator means disposed in the main and slow systems of the carburetor for controlling the air-fuel ratio of the mixture supplied to the engine, control circuit means for driving said actuator means in accordance with a signal from the exhaust gas sensor, a 3-way catalyst disposed in the exhaust system at a downstream side of said exhaust gas sensor, idle detector means for detecting an idle condition of the engine, an air supply means for supplying secondary air to the exhaust system at an upstream side of said 3-way catalyst in accordance with a signal from the temperature detector means for detecting the non-warm condition of the engine, the improvement wherein

said air supply means comprises a diaphragm type fuel pump means, having a diaphragm and a rocker arm operatively connected thereto, for being driven by the engine shaft via said rocker arm,

said detector means are connected to said control circuit means,

said air supply means defining a chamber at one side of the diaphragm and having an air inlet port and air discharge port communicating therewith,

change-over solenoid valve means for being driven by said control circuit means in accordance with signals from said detector means and for communicating therethrough said air discharge port with the upstream side of the 3-way catalyst and the air cleaner respectively.

4,276,746

COMPOUND VALVE DEVICE

Minoru Yamanaka, and Tooru Tamura, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 6, 1979, Ser. No. 9,906
Claims priority, application Japan, Feb. 10, 1978, 53/14442
Int. Cl.³ F01N *3/10*
U.S. Cl. 60—290 **4 Claims**

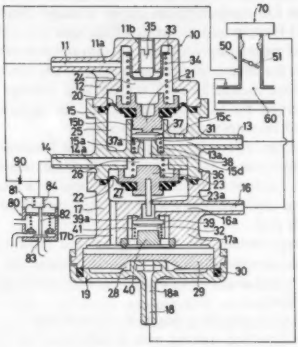
1. A compound valve device comprising:

a body member means having a signal port, a first input port connected to an air cleaner, a first output port, a second

input port connected to said air cleaner, and a second output port;

a first diaphragm forming a first signal chamber and a first atmospheric chamber within said body member means, said first signal chamber connected to said signal port, said first atmospheric chamber being connected to said first input port, said first diaphragm being movable in response to the signal pressure in said signal chamber;

a first valve member controlling the atmospheric communication between said first input port and said output port by the movement of said first diaphragm;



a second diaphragm forming a second signal chamber and a second atmospheric chamber within said body member means, said second signal chamber connected to said first output port, said second atmospheric chamber being connected to said second input port, said second diaphragm being movable in response to the pressure in said second signal chamber; and

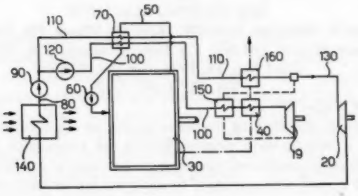
a second valve member controlling the atmospheric communication between said second input port and said second output port by the movement of said second diaphragm, said second valve member being operated immediately after the operation of said first valve member in response to the signal pressure in said signal port.

4,276,747

HEAT RECOVERY SYSTEM

Roberto Faldella, and Riccardo Margary, both of Turin, Italy, assignors to Fiat Societa Per Azioni, Turin, Italy

Filed Nov. 30, 1978, Ser. No. 965,133
Int. Cl.³ F01K *23/10*
U.S. Cl. 60—618 **2 Claims**



1. A heat recovery system for the production of mechanical energy from two heat sources respectively constituted by the cooling circuit of an internal combustion engine and the exhaust gases emitted by said internal combustion engine, said heat recovery system comprising a circuit for a working fluid, said circuit including:

first heat exchange means for transferring heat from said cooling circuit to said working fluid,

second heat exchange means for transferring heat from said exhaust gases to said working fluid,

first expander means and second expander means for expanding the heated working fluid and producing mechanical energy,

a condenser disposed downstream of said first expander means and said second expander means,

a circulation pump downstream of said condenser,

a main duct for working fluid, in which said second expander means, said condenser and said circulation pump are interposed;

said main duct branching into a first branch duct and a second branch duct downstream of said circulation pump,

said second heat exchange means being interposed in said first branch duct and said first expander means being also interposed in said first branch duct downstream of said second heat exchange means,

an auxiliary pump in said first branch duct upstream of said second heat exchange means,

said first branch duct rejoining said second branch duct upstream of said second expander means, and

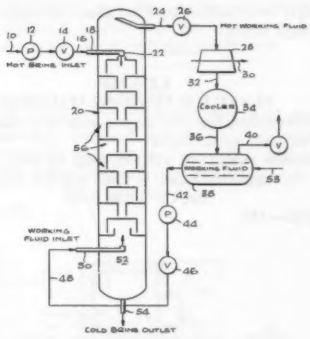
said first heat exchange means being disposed downstream of said circulation pump being traversed by the total flow of working fluid wherein said first heat exchange means is interposed both in said first branch duct and said second branch duct, said auxiliary pump being interposed in said first branch duct upstream of said first heat exchange means.

4,276,748

RECOVERY OF ENERGY FROM GEOTHERMAL BRINE AND OTHER HOT WATER SOURCES

Edward F. Wahl, III, Claremont, and Frederic B. Boucher, San Juan Capistrano, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 795,523, May 10, 1977, abandoned.
This application Oct. 5, 1979, Ser. No. 83,112
Int. Cl.³ F03G *7/00*
U.S. Cl. 60—641 D **25 Claims**



1. In a process for recovery of energy from hot water-containing fluids including geothermal brine and other hot water-containing sources, by introducing said hot water-containing fluid in a heat exchange column in direct heat exchange relation therein with an immiscible working fluid in liquid form, the improvement which comprises

(a) providing a plurality of vertically spaced sieve plates in said column, said sieve plates including perforated trays and downcomers associated with said trays, and

(b) flowing said hot water-containing fluid and said working fluid in countercurrent direct heat exchange relation through said perforated trays and said downcomers,

the diameter of the holes in said trays, the number of holes

therein, the downcomer area and the spacing between adjacent trays being selected to obtain maximum throughput, i.e. mass flow rate, of said hot water-containing fluid in said column, and

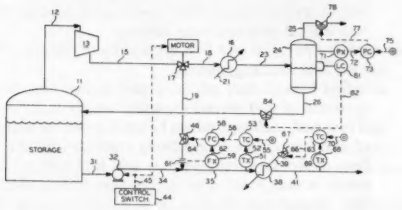
wherein maximum throughput of said water-containing fluid corresponds to maximum downcomer area.

4,276,749

STORAGE SYSTEM FOR LIQUEFIED GASES

Ralph P. Crowley, Bountiful, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 16, 1980, Ser. No. 140,904
Int. Cl.³ F17C 7/02
U.S. Cl. 62—51 **11 Claims**



1. Apparatus comprising:

a storage means for liquefied gases;

means for withdrawing liquefied gases from said storage means;

a compressor means having a suction inlet and a discharge outlet;

means for withdrawing a vapor stream from said storage means and for providing said vapor stream to the suction inlet of said compressor means; and

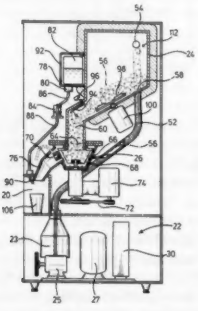
means for withdrawing the compressed gases from the discharge outlet of said compressor means and for mixing at least a portion of said compressed gases with the liquefied gases withdrawn from said storage means to thereby supply heat to the liquefied gases withdrawn from said storage means.

4,276,750

FLAKE ICE VENDING MACHINE

Sakichi Kawasumi, Toyoake, Japan, assignor to Hoshizaki Electric Co., Ltd., Aichi, Japan

Continuation of Ser. No. 826,135, Aug. 19, 1977, abandoned.
This application Jan. 9, 1980, Ser. No. 111,008
Int. Cl.³ F25C 5/14
U.S. Cl. 62—137 **10 Claims**



1. In a flake ice vending machine for vending disposable receptacles filled with a mixture of flake ice and a flavored syrup, the improved combination comprising:

an auger type ice making means comprising a refrigerated cylinder and rotating auger contained within said cylinder, said auger scraping ice formed on an inner circumferential surface of said cylinder;

a storage means for storing said ice formed by said ice making means, said storage means mechanically connected to said ice making means by a conduit, said auger of said ice making means feeding said ice formed from said ice making means to said storage means through said conduit;

a first means provided at an upper portion of said storage means for measuring an upper storage limit of said ice stored therein and for controlling said ice making means;

a second means provided at a bottom portion of said storage means for measuring the presence of ice stored therein;

an agitator means located within said storage means and controlled by said second means for agitating said ice formed by said ice making means;

an ice slicer means for slicing said ice formed by said ice making means into flake ice, said slicer means mechanically connected to said storage means by a feed means for feeding said ice from said storage means to said slicer means; and

a discharge means for discharging said flake ice, said discharge means mechanically connected to said slicer means; said improved combination producing flake ice for dispensing.

9. A flake ice vending machine comprising:

an auger type ice making unit in which an ice layer formed on an inner circumferential wall surface of a freezing cylinder is scraped by an auger and then compressed by a press head to form a plurality of ice masses;

a means for transferring the ice masses extruded from said ice making unit;

a storage chamber for storing the transferred ice masses;

a means for slicing the ice masses supplied from said storage chamber to discharge a flake ice;

a means for storing and supplying a receptacle for receiving the flake ice into a dispensing outlet tray;

a means for pouring a flavored liquid onto the flake ice in the receptacle;

a means for discharging water against a dispensing outlet tray for cleaning;

wherein the ice storage chamber at it upper portion is provided with a means for measuring an upper storage limit of the ice masses and for controlling said ice making unit and is provided at its bottom portion with a means for measuring the presence of the ice masses and for activating an agitator provided in the bottom of the storage chamber.

4,276,751

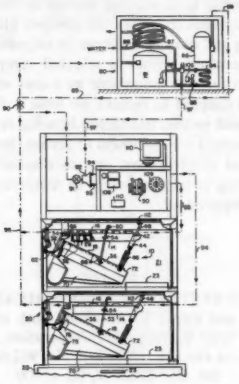
ICE MAKING MACHINE

Robert N. Saltzman, 7420 SW. 163rd St., Miami, Fla. 33157, and Bruce Burrell, 145 NE. 121 Ter., N. Miami, Fla. 33161

Filed Sep. 11, 1978, Ser. No. 940,908
Int. Cl.³ F25C 1/12
U.S. Cl. 62—138 **5 Claims**

1. In an ice making machine having an ice forming enclosure; a refrigeration system; having an evaporator through which evaporating refrigerant is passed in heat exchange relationship with said enclosure to cool said ice forming enclosure during a freezing cycle; valve means in said refrigeration system permitting the flow of hot refrigerant gas to said evaporator to heat said ice forming enclosure to harvest the ice therefrom during a harvest cycle; and water supply means supplying water to said ice forming enclosure; control means for automatically cycling the machine through freezing and ice harvesting cycles, said control means comprising: a pressure responsive switch responding to pressures in the evaporator of the refrigeration system indicating the formation of ice in said ice forming enclosure, said pressure sensitive switch arranged

in a circuit controlling said valve means and said water supply means to cause said valve means to permit the flow of hot refrigerant into heat exchange relationship with said enclosure to effect defrost when a given pressure condition has been



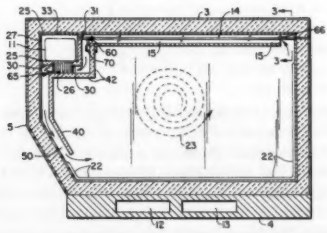
sensed, and to discontinue the flow of water to said ice forming enclosure; and a timer in an electrical circuit with said pressure sensitive switch, said timer causing said switch to move to a position discontinuing defrost and initiating the freezing cycle.

4,276,752

REFRIGERATED AIR CARGO CONTAINER

Peter R. Modler, Los Angeles; Harold E. Dittmer, San Francisco; Richard L. Rose, Newark, and John A. Stafsnes, San Anselmo, all of Calif., assignors to Pax Equipment Management, Inc., San Francisco, Calif.

Filed Sep. 22, 1978, Ser. No. 944,869
Int. Cl.³ F25D *3/12*
U.S. Cl. 62—166 **7 Claims**



1. A refrigerated cargo container comprising:

an insulated housing assembly having an insulated top panel, an insulated bottom panel, an insulated back panel, two respective insulated side panels, an insulated front panel with insulated door means releasably engageable across a portion of said front panel, all of said panels being sealably connected to each other and with sealing means cooperating between said door means and said housing assembly to make said housing assembly substantially air-tight when said door means is in the closed position relative to said housing assembly;

a bunker located in said housing assembly for receiving a predetermined amount of coolant, said bunker being substantially insulated to prolong the period during which the coolant sublimes, vaporizes or liquifies such that the time required for the coolant to change states approximately offsets the temperature increase in the housing assembly to maintain the cargo in the housing assembly at a substantially constant temperature, said bunker further having at least one heat exchange portion positioned to allow heat from said housing assembly to pass to said coolant such that said coolant sublimes, vaporizes or liquifies, cooling said heat exchange portion of said bunker;

an insulated baffle surrounding a portion of said bunker including said heat exchange portion of said bunker such that cargo located in said housing assembly in close proximity to said carbon dioxide bunker is protected from freezing temperatures;

an air inlet duct extending along and parallel to the top panel of said housing assembly to said bunker, from the side wall opposite to said bunker, said inlet duct being open to the interior of said housing only at a point adjacent to said opposite side wall, for directing warm air from the area along the side panel of said housing assembly opposite said bunker to the area around said bunker including said heat exchange portion of said bunker where the warm air from said housing assembly is cooled by said heat exchange portion;

a curtain wall extending from said baffle surrounding a portion of said bunker and continuing along one of said housing side panels below said bunker for a major part of the length of said panel forming an output air duct to allow cool air from said heat exchange portion of said bunker to pass through said output air duct to circulate through said housing interior; protruberances projecting from the interior surface of said side, back and bottom panels of said housing assembly to prevent cargo from directly contacting said panels such that cool air from said output duct will circulate along some of the recessed surfaces of said wall and throughout said housing assembly to maintain said cargo at a substantially constant temperature; and

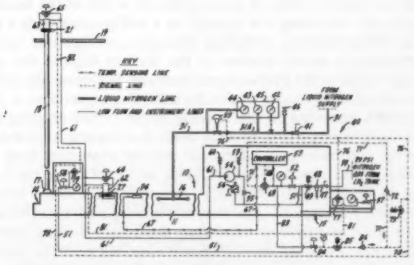
a chimney duct located along the top panel of said housing assembly between said inlet duct and said top panel and extending along said top panel for substantially the length of said top panel and having one of its two-end portions connected to said bunker to allow coolant vapor from said bunker to enter said chimney and to pass through said chimney exiting through the other end portion of said chimney as said coolant sublimes, liquifies or vaporizes, said chimney duct being insulated for the greater portion of its length along said top housing panel with a non-insulated portion located near the opening of said inlet duct near the side panel opposite said bunker;

4,276,753

CRYOGENIC FREEZING TUNNEL CONTROL SYSTEM

Glenn A. Sandberg, Lockport, and Wilbur A. Janssen, New Lenox, both of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed May 19, 1980, Ser. No. 150,893
Int. Cl.³ F25D *17/04*
U.S. Cl. 62—186 **6 Claims**



1. In a cryogenic food product freezing tunnel of the kind comprising:

an elongated tunnel housing;

conveyor means extending through the housing to transport

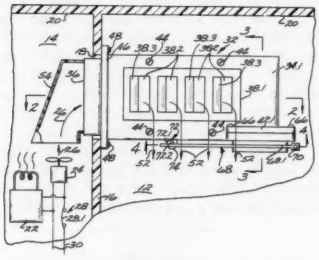
food product from a product entrance end to a product exit end;
cryogen input means to introduce a cryogen into the tunnel at a cryogen input location near the exit end;
exhaust means, including an exhaust stack and an exhaust blower at the top of the stack, to exhaust cryogen gas from a location near the entrance end of the tunnel;
a plurality of circulating fans at spaced locations along the length of the tunnel for deflecting vaporized cryogen into contact with food product traversing the tunnel;
a directional blower, including a variable speed drive, mounted in the tunnel between the cryogen input location and the entrance end;
and cryogen input control means, including a temperature sensor located between the directional control blower and the cryogen input location, for controlling the rate of input of cryogen into the tunnel;
an improved cryogen gas flow control system comprising:
a variable speed drive for the exhaust blower; and
unified blower speed control means for varying the speed of the directional blower and the speed of the exhaust blower, as functions of the temperature in the tunnel taken at a position intermediate the cryogen input location and the position of the directional blower.

4,276,754

REFRIGERATOR CONTROL AND SYSTEM

Henry Ty, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1979, Ser. No. 78,427
Int. Cl.³ F25D *17/04*; G05D *23/02*
U.S. Cl. 62—187 **7 Claims**



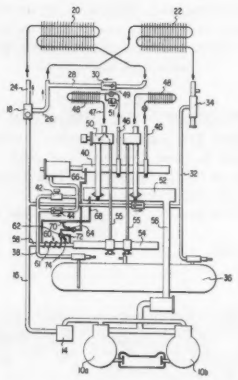
1. An integral thermally responsive air flow control mountable as a unit in a refrigerator for regulating air flow from a first refrigerator compartment through a refrigerator wall into a second compartment in response to changes in temperature in the second compartment comprising an elongated housing having an opening at one end, having a closed opposite end and having an orifice of selected size in a side of the housing, means for mounting the control on a refrigerator with a portion of the housing extending through a refrigerator wall in substantially sealed relation to the wall to dispose the open housing end in the first compartment and to dispose the orifice and the closed housing end in the second compartment, a shaft rotatably mounted on the housing at the closed housing end, the shaft having a first portion inside the housing adjacent the orifice and having an additional portion extending from the housing, an elongated damper blade mounted inside the housing on the first shaft portion to extend longitudinally toward the open housing end to be movable wholly within the housing between a first position extending along said housing side for substantially closing the orifice and a second position opening the orifice to permit air flow from the open housing end through the orifice, a thermally responsive thermostat metal helical coil spring having inner end operatively secured to said additional shaft portion to mount the spring outside the housing to be movable in response to temperature changes in the second refrigerator compartment for moving the damper blade in response to such changes, the coil spring also having an outer end, and adjust means movably mounted on the housing and secured to the outer end of the coil spring for selectively moving the spring to a selected extend so that the spring is adapted to progressively move the damper blade between its orifice opening and closing positions in response to changes in the coil temperature within a selected temperature range, whereby the control is mountable as a unit so that the open housing end is adapted to receive air from a first refrigerator compartment and so that the closed housing end is adapted to extend into a second compartment to permit the orifice to open into the second compartment and to dispose the thermally responsive spring to be responsive to temperature changes in the second compartment.

4,276,755

GAS DEFROST SYSTEM INCLUDING HEAT EXCHANGE

Arthur Perez, and Fayez F. Abraham, both of Niles, Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Filed Oct. 18, 1978, Ser. No. 952,612
Int. Cl.³ F25B *41/00, 47/00*
U.S. Cl. 62—196 B **29 Claims**



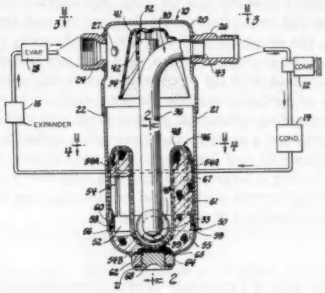
1. A defrosting arrangement for a refrigeration system having compressor means for compressing a refrigerant to a relatively high compressor discharge pressure, condenser means for condensing that compressed refrigerant to a liquid at substantially that relatively high pressure, evaporator means coupled between said condenser means and said compressor means to accomplish the desired normal refrigeration by evaporating that liquid refrigerant at a relatively low pressure and returning the thus formed gaseous refrigerant to the intake of the compressor means as a substantial heat load, said defrosting arrangement comprising:
defrost conduit means for selectively conducting gaseous refrigerant from the compressor discharge to the evaporator means for defrosting that evaporator means;
heat exchange means coupled between the liquid side and the suction side of the refrigeration system and in heat exchange relation with said defrost conduit means for removing heat from hot refrigerant gas passing through said defrost conduit means to the evaporator means, said heat exchange means acting as an additional load to absorb liquid refrigerant produced by the defrosting of said evaporator means; and
means for shutting off refrigerant flow through said heat exchange means when the evaporated refrigerant at the outlet thereof reaches a predetermined temperature.

4,276,756

LIQUID ACCUMULATOR

J. D. Livesay, Tipp City, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 7, 1980, Ser. No. 156,320
Int. Cl.³ F25B 43/00
U.S. Cl. 62—503 3 Claims



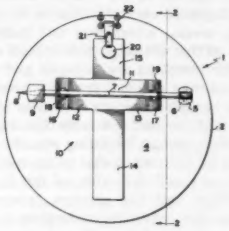
1. In a liquid accumulator for air conditioning systems and the like wherein the accumulator is of the type having a permanently assembled casing enclosing both liquid separator means and desiccant container means and wherein the liquid separator means includes a generally U-shaped tube having a bight portion with a bleed opening therethrough located in a bottom end of the casing and wherein the liquid separator means operates to separate liquid including refrigerant, oil and water from vaporous refrigerant flow received from the system and deposit same in the bottom of the casing and wherein desiccant in the desiccant container means adsorbs the deposited water while the deposited liquid refrigerant and oil is permitted to be returned through the bleed opening in the bight portion and thence through the tube in vaporous form back to the system: the improvement in a serviceable desiccant container arrangement comprising in combination, porous desiccant container means adapted to be received in the bottom of the casing prior to insertion of the bight portion of the tube therein and permanent closure of the casing, said desiccant container means having an open lower end, seal-attaching means for sealingly attaching said lower end of said desiccant container means to said casing so as to retain same in the bottom of the casing when the casing is inverted and to thereafter seal off escape of desiccant from the interior of said desiccant container means to the interior of the casing above said seal-attaching means, said desiccant container means further having an external cavity adapted to receive the bight portion of the tube therein, an access opening formed in the bottom of the casing and opening to the interior of said desiccant container means through said open lower end thereof, access lifting means integral with the bottom end of the casing and extending about said access opening, and detachable seal-closure means for cooperating with said access fitting means to close said access opening after desiccant hs been loaded therethrough into said desiccant container means whereby said desiccant container means may be gravity filled with desiccant both for the first time and later in service through said access opening after the casing has been permanently closed by inversion thereof while said desiccant container means while so inverted remains secured in place by said seal-attaching means and whereby saturated desiccant may be drained from said desiccant container means through said access opening when the casing is in its normal upright position prior to refilling.

4,276,757

JEWELRY SUPPORT

John H. Boening, 250 S. Main St., Frankenmuth, Mich. 48734

Filed Jun. 5, 1980, Ser. No. 156,558
Int. Cl.³ A44C 25/00, 3/00
U.S. Cl. 63—1 R 11 Claims



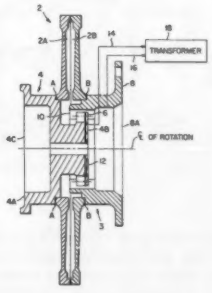
1. A support for use in converting an article of jewelry having a mounting pin to a pendant capable of being suspended from a chain or the like, said support comprising an elongate, resiliently flexible concavo-convex arm terminating at its opposite ends in fingers bent to extend beyond the convex side of said arm, each of said fingers having an opening therein for the accommodation of said pin, and means for attaching said arm to a chain or the like, the sizes and positions of said openings in said fingers being such that alignment of said openings for enabling insertion of said pin through both of said openings requires flexure of said arm to reduce its concavity, the resiliency of said arm enabling the latter to bear firmly against said pin and urge those portions of said fingers at the edges of the respective openings into engagement with said pin.

4,276,758

FAIL SAFE REDUNDANT DRIVE SHAFT APPARATUS INCLUDING ELECTRICALLY OPERATIVE FAILURE DETECTION MEANS

William E. Coman, Newport, and Florian E. Tepolt, Utica, both of N.Y., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 27, 1979, Ser. No. 79,613
Int. Cl.³ F16D 3/18, 3/78
U.S. Cl. 64—9 R 6 Claims



1. Drive shaft apparatus, comprising:
a drive shaft having driving and driven members;
primary torque transmitting means coupling the driving and driven members;
redundant torque transmitting means coupled to the primary torque transmitting means and rendered operative upon a failure of the primary torque transmitting means for coupling the driving and driven members, the redundant torque transmitting means including a first spline member coupled to the primary torque transmitting means and

coupled to one of the driving and driven shafts, a second spline member coupled to the primary torque transmitting means and coupled to the other of the driving and driven shafts, the first and second spline members being in mating relation, with the respective splines thereof being disengaged so that the redundant torque transmitting means is inoperative when the primary torque transmitting means is operative, and one of the first and second spline members being displaced upon a failure of the primary torque transmitting means, whereupon said means is rendered inoperative so that the respective splines of the first and second spline members are engaged and the redundant torque transmitting means is rendered operative;

the one spline member having a first main torque transmitting section and a second relatively thin section secured to the first section, and an insulating member separating the first and second sections so that an open electrical circuit through the one and the other of the first and second spline members and the primary torque transmitting means is provided when the redundant torque transmitting means is inoperative, with said circuit being closed through the engagement of the respective splines of the first and second spline members when the redundant torque transmitting means is operative;

a transformer circuit arranged with the redundant torque transmitting means and including a stationary winding, means for exciting the stationary winding and a winding inductively coupled to the stationary winding and rotating with the drive shaft;

the operative redundant torques transmitting means affecting the transformer circuit for short circuiting the rotating winding; and

means connected to the transformer circuit for sensing the short circuit which is indicative of a failure of the primary torque transmitting means.

4,276,759

CENTERED DOUBLE JOINT

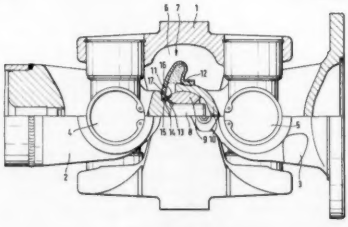
Gerd Faulbecker, Essen, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,148

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833149

Int. Cl.³ F16D *3/26*

U.S. Cl. 64—17 R **10 Claims**



1. Centered double joint comprising a first single joint, a second single joint, and centering means interconnecting said first and second joints, said centering means comprising a pin secured to and extending axially outwardly from said first single joint toward said second single joint, an intermediate element fitted on and laterally encircling said pin, said intermediate element having a first end located closer to said first single joint and a second end located closer to said second single joint, a journal fixed to said second single joint and extending outwardly therefrom toward said first single joint, said intermediate element located within said journal with the outer surface of said intermediate element disposed in contact with a complementary shaped surface in the interior of said journal, and a gasket laterally enclosing at least an axially extending portion of said pin and said journal, said gasket extending in the axial direction of said pin and having a first end and a second end with the first end secured to said pin and the second end secured to said journal, first means for securing the first end of said gasket to said pin, and second means for securing the second end of said gasket to said journal, wherein the improvement comprises that said first means comprises a reinforcing ring bonded to said gasket at the first end thereof, said reinforcing ring having a first cylindrical part extending in generally parallel relation with the axis of said pin and said first part having a first end spaced from said intermediate element and a second end adjacent the first end of said intermediate element, the second end of said first part forming a stop face extending transversely of the axis of said pin and disposed in surface contact with the transversely extending surface at the first end of said intermediate element, said pin having a first axially extending cylindrical portion fitted into said intermediate element, and a second axially extending cylindrical portion located closer to said first single joint, said second cylindrical portion having a larger diameter than said first portion, and said first cylindrical part of said reinforcing ring is press fit onto said cylindrical portion of said pin.

4,276,760

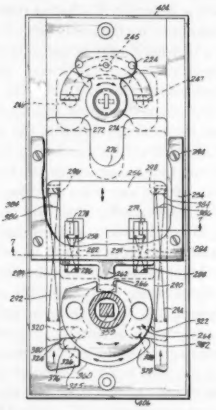
TWO-BOLT LOCKSET WITH SIMULTANEOUS LOCKING AND UNLOCKING OF ITS BOLTS

Roger J. Nolin, 1838 Whitehurst Dr., Monterey Park, Calif. 91754

Filed Oct. 22, 1979, Ser. No. 86,945

Int. Cl.³ E05B *59/02*

U.S. Cl. 70—107 **30 Claims**



1. An improvement in an integrated, two-bolt lockset of the type that mounts on the surface of a door comprising:

(a) a case;

(b) means for mounting the case to the inside of a door;

(c) a deadbolt assembly including an outside operator adapted for mounting on the outside of the door and an inside operator mounted on the case, the deadbolt assembly including a deadbolt and a deadbolt drive responsive to either of the deadbolt operators to rotate between a locked and an unlocked position, the deadbolt drive including crank means;

(d) a latch bolt assembly including an outside operator adapted for mounting on the outside of the door and an inside operator mounted on the case, the latch bolt assembly including a latch bolt and a latch bolt drive responsive to either of the latch bolt operators to rotate between a latch bolt open and a latch bolt closed position;

(e) a slide mounted in the case for translation between a

locked position proximate the latch bolt assembly and an unlocked position proximate the deadbolt assembly;

(f) biasing means to bias the slide away from the latch bolt assembly;

(g) an actuator on the latch bolt drive;

(h) means of the slide and the actuator to lock the actuator and lock the latch bolt assembly in a locked position of the slide; and

(i) the crank means of the deadbolt drive being rotatable between a locked and an unlocked position and operable during rotation between its unlocked and locked positions to engage the slide in its unlocked position and to translate the slide against the force of the biasing means into the locked position of the slide upon the locking actuation of either of the deadbolt operators, the crank means rotating with either of the deadbolt operators to disengage the slide and thereby unlock the actuator upon rotation of either of the deadbolt operators into an unlocked position.

4,276,761

STEERING COLUMN AND IGNITION LOCK FOR MOTOR VEHICLE

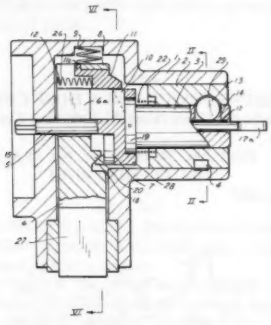
Rudolf Eichenauer, Höllbergstrasse 1, D-6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,397

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801531

Int. Cl.³ B60R *25/02*; E05B *65/12*

U.S. Cl. 70—252 **3 Claims**



1. In a lock arrangement for a motor vehicle having a steering column, which comprises

(a) a housing defining an axial bore and a cross bore intersecting therewith,

(b) a key controlled lock cylinder mounted in the axial bore of the housing for spring-biased axial displacement from an outwardly into an inwardly displaced position, and for rotation by the key about the axis of the bore in the inwardly displaced position into selected operating positions including a driving position, a ready-to-lock position and a locking position,

(1) the lock cylinder having an axial keyhole for inserting the key in one axial direction and withdrawing the key in the opposite axial direction,

(c) a lock bolt mounted in the cross bore for displacement from a retracted position into a locking position upon withdrawal of the key from the keyhole in the opposite axial direction,

(1) the bolt having a keeper engaging a recess in the steering column in the locking position,

(d) spring means engaging the lock bolt and biased to displace the lock bolt into the locking position,

(1) the lock bolt cooperating with the lock cylinder to displace the lock cylinder into the outwardly displaced position during the displacement of the lock bolt into the locking position under the bias of the spring means

(e) a latch member mounted on the lock bolt, and

(f) actuating means arranged to displace the lock bolt between the retracted and locking positions, the bolt actuating means including

(1) a driving member operated by the rotation of the lock cylinder to displace the bolt against the bias of the spring means into the retracted position to disengage the keeper from the steering column,

the improvement of

(g) the latch member being slidable in the direction of the axis and spring-biased into a position projecting from the bolt towards the lock cylinder,

(h) the driving member including a control ring rotating and axially displaced with the lock cylinder, and eccentric cam means fixedly arranged eccentrically on the control ring, the cam means comprising a first cam cooperating with the latch member in the driving position of the lock cylinder for maintaining the lock bolt in the retracted position, a second arcuate cam having a periphery and an oblique camming face for engagement with the latch member and depressing the latch member against the spring bias during rotation of the lock cylinder from the locking into the driving position, the periphery of the second arcuate cam subtending the projecting latch member during rotation of the lock cylinder from the driving into the ready-to-lock position for maintaining the lock bolt in the retracted position, and a third cam projecting from the control ring towards the lock bolt and having an oblique camming face, and

(i) a fourth cam fixed on the lock bolt, the fourth cam and the third cam being arranged to position the oblique camming face of the third cam in subtending engagement with the fourth cam in the ready-to-lock position whereby the lock bolt is temporarily prevented from displacement from the retracted into the locking position, the cams being dimensioned and shaped to enable the lock cylinder to be rotated into the selected operating positions and to maintain the lock bolt in the retracted position during the driving and ready-to-lock position of the lock cylinder.

4,276,762

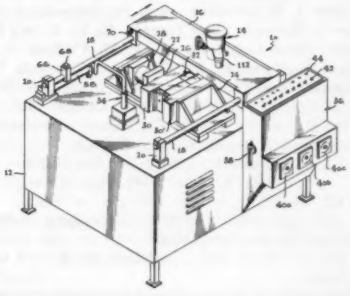
JOGGLING MACHINE

Butler A. Mershon, and Keith A. Wilhelm, both of Burbank, Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Nov. 6, 1978, Ser. No. 957,692

Int. Cl.³ B21D *11/18*

U.S. Cl. 72—13 **34 Claims**



1. A joggling machine incuding a joggling tool for forming an indentation in a workpiece comprising:

means for securing said workpiece;

means for heating said workpiece to a preselected temperature;

means for supporting said joggling tool above the plane of said workpiece and for moving said joggling tool into

position over said workpiece prior to actuating said joggling tool; and

means for actuating said joggling tool after said joggling tool has moved into position over said workpiece.

4,276,763

METHOD OF ROLLING ANGULAR PROFILES HAVING FLANGES OF EQUAL LENGTH

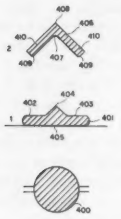
Fernand Schmitz, Lorentzweiler, Luxembourg, assignor to ARBED, Acieries Reunies de Burbach-Eich-Dudelange, Societe Anonyme, Luxembourg, Luxembourg

Filed Jul. 5, 1979, Ser. No. 54,792

Claims priority, application Luxembourg, Aug. 17, 1978, 80119

Int. Cl.³ B21B *1/08*

U.S. Cl. 72—234 **9 Claims**



1. A method of rolling an angle structural shape having a pair of flanges of equal width, at right angles to one another, consisting of the following steps of:

initially rolling a bar of round cross section in a single rolling pass to form a flattened blank having a central protuberance of angular cross section centrally of the blank wih the external flanks of said protuberance lying at substantially right angles to one another and with said blank having a pair of wings lying to opposite sides of said protuberance; and

bending said blank, in a single pass by rolling same with interposition of at most two rolling passes in which the blank remains flat while the thickness thereof is reduced, so that said wings lie substantially at a right angle to one another to form said flanges while said protuberance forms a vertex of the resulting angle structural shape.

4,276,764

DIE SET FOR SIZING SECTIONS

Vladislav A. Kozhevnikov, ulitsa Plekhanovskaya, 43, kv. 25; Ivan V. Kononov, ulitsa Torpedo, 40, kv. 4; Ivan E. Maslennikov, ulitsa Lizjukova, 43, kv. 57; Vladimir N. Platonov, ulitsa Lizjukova, 43, kv. 112, all of, Voronezh; Mikhail V. Kharitonovich, Chapaevsky pereulok, 12/1, kv. 69, Moscow, all of U.S.S.R.; deceased Viktor I. Ustinov, late of Moscow, U.S.S.R., and by Klavdia G. Ustinov, administrator, ulitsa Tolbukhina, 8, kv. 65, Moscow, U.S.S.R.

Filed Jul. 17, 1979, Ser. No. 58,308

Int. Cl.³ B21C *3/00*; B21D *28/00*

U.S. Cl. 72—275 **1 Claim**

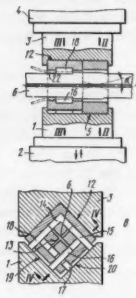
1. A die set having a central axis for sizing sections having projecting flanges, comprising:

a movable block and a stationary block each having end faces;

cutout portions formed in said respective end faces of said blocks facing said central axis of said die set, said cutout portions defining inclined surfaces intersecting along a straight line parallel with said central axis of said die set;

a sizing die accommodated in said cutout portions, and movable knives and stationary knives adapted for trimming said flanges of said sections successively accommodated in said cutout portions;

a jig structure defining said stationary knives secured on said stationary block, said jig structure having formed therein channels arranged in accordance with the contour of said section and having formed therein grooves extending



perpendicularly to said channels, each said movable knives being accommodated in said grooves for direct interaction with said inclined surfaces of said cutout portion of said movable block to be actuated thereby.

4,276,765

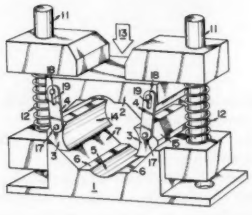
PRESSING DEVICE FOR A HOSE COUPLER

Rikizo Yoneda, 64, Umenokimachi, Sakyoku, Kyoto-shi, Kyoto-fu, Japan

Filed Jun. 14, 1979, Ser. No. 48,653

Int. Cl.³ B21D *41/04*

U.S. Cl. 72—402 **6 Claims**

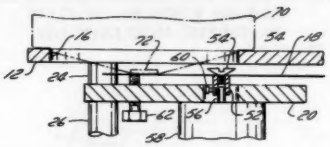


1. A hose coupler compressor comprising: a lower die on which an external pipe of said hose coupler is placed; an upper vertically movable pressing element; and a pair of side dies engageable by said pressing element and disposed between said lower die and said pressing element, and movable downwardly and inwardly toward the center of the external pipe by means of outwardly facing sloping side surfaces thereof cooperating with inwardly facing sloping surfaces fixed relative to said lower die; whereby upon downward movement of the pressing element the end of a hose is held between the internal and external pipes of a hose coupler, and said external pipe is pressed on its outer periphery and deformed by said dies so that the hose end is secured to the hose coupler; and means suspending each side die from said vertically movable pressing element for limited vertical and transverse movement relative to said vertically movable element so that said side dies separate laterally from the external pipe and are lifted upwardly during upward movement of the pressing element.

4,276,766
ROUGHNESS SENSOR CALIBRATION

John M. Lucas, Montreal, and Raman Nayar, Baie D'Urfe, both of Canada, assignors to Domtar Inc., Montreal, Canada

Filed Mar. 3, 1980, Ser. No. 126,984
Int. Cl.³ G01B 5/28, 11/30
U.S. Cl. 73—1 R 3 Claims

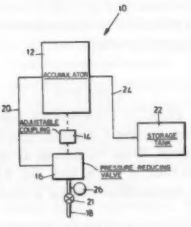


1. A calibrator for calibrating surface sensors having optical parts adapted to contact a surface being sensed comprising; a base plate, a disc having a surface thereof lying substantially in a plane, means for positioning said roughness sensor to be calibrated in a fixed position on said base plate with said optical contacting part of said sensor in a position to contact the surface of said disc and oriented to said plane in substantially the same manner as said sensor is oriented to a surface to be sensed; means for rotating said disc with said surface of said disc in said plane and means to oscillate said disc in a direction substantially perpendicular to the axis of rotation of said disc whereby said optical sensor contacts said surface of said disc and moves back and forth in contact with said surface of said disc along substantially spiral paths.

4,276,767
EROSION POTENTIAL DETERMINATIONS

Frederick D. Cartwright, 506 Lake Club Apts., Lake Rd., Germiston, Transvaal, South Africa

Filed Jul. 26, 1979, Ser. No. 60,858
Claims priority, application South Africa, Aug. 4, 1978, 78/4565; Apr. 23, 1979, 79/1906
Int. Cl.³ G01N 3/56
U.S. Cl. 73—7 8 Claims

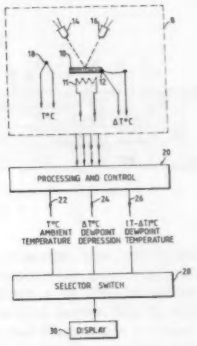


1. A method of determining the erosion potential of particulate material including the steps of directing a jet of fluid onto the surface of the material from a nozzle located a fixed distance from the surface of the material, progressively increasing the pressure of the jet from zero pressure until particles of material at the surface begin to disperse and measuring the pressure of the fluid leaving the jet when the particles of the material begin to disperse against a scale of known erosion pressures to determine the erosion potential of the material.

4,276,768
RELATES TO APPARATUS FOR MEASURING THE DEW POINT

Fali M. Dadachanji, 32 Highfield Park, Marlow, Buckinghamshire, England

Filed Nov. 16, 1979, Ser. No. 95,105
Claims priority, application United Kingdom, Nov. 22, 1978, 45674/78
Int. Cl.³ G01N 25/68
U.S. Cl. 73—17 A 5 Claims



1. Apparatus for measuring the dew point, comprising a body on which dew can form, cooling means for cooling said body, dew-sensing means for sensing the formation of dew on said body, temperature sensing means for sensing the temperature of said body, and control means including recording means, said control means being operable to cause the apparatus to perform repeatedly a cycle in which said body is cooled gradually until the formation of dew thereon is detected, the temperature at which dew forms on said body is recorded by said recording means, and the temperature of said body is subsequently allowed to rise prior to cooling again in the next succeeding cycle, the temperature of said body being monitored continuously by said temperature sensing means and the rate of cooling of said body being controlled by said control means in dependence upon the difference between the instantaneous temperature of said body and the dew point temperature measured in a preceding cycle and recorded by said recording means, in such a way that the rate of cooling is lower for at least a range of temperatures closer to said dew point temperature recorded in said previous cycle than for instantaneous temperatures of said body further from said dew point temperature recorded in said previous cycle.

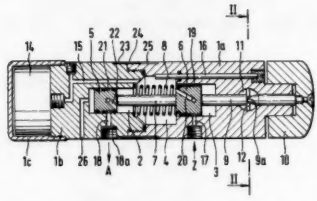
4,276,769
APPARATUS FOR DETERMINING THE CARBON DIOXIDE CONTENT OF A LIQUID, ESPECIALLY A BEVERAGE

Dieter Wieland, Oststrasse 1, 4000 Düsseldorf, and Hartnut Meinert, Hünnefeldstrasse 22, 4950 Minden/Westfalen, both of Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,709
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849401; May 16, 1979, 2919767; May 18, 1979, 2920154
Int. Cl.³ G01N 7/14
U.S. Cl. 73—19 17 Claims

1. In an apparatus for determining the carbon dioxide content of a liquid, especially of a beverage, comprising a housing which has an expansion chamber for receiving the liquid to be measured, said chamber connected to an inlet line and an outlet line provided with valve means to a liquid inlet and a liquid outlet, respectively, and which is or can be connected to a pressure gauge and to a temperature measuring device, and whose volume is variable according to the position of a piston

guided displaceably in it, and having a means for the displacement of the piston from a first position in which the volume of the expansion chamber is at a minimum to a second position in which the volume of the expansion chamber is at a maximum, the improvement wherein said apparatus comprises a plurality of hollow cylindrical sections comprising a first hollow cylindrical section and a second hollow cylindrical section each of which accommodates a displaceably guided piston, said pistons being in line with one another axially, and rigidly joined with one another, the piston of said first hollow cylindrical section being of a smaller diameter than the piston of said second



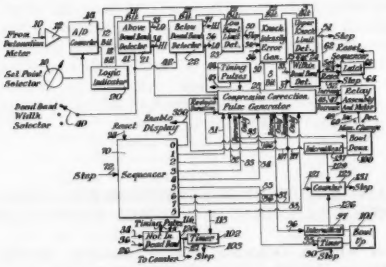
hollow cylindrical section, said expansion chamber being disposed between the confronting end surfaces of said pistons and connected at one of its ends to a liquid feed line carried through the piston of said second hollow cyindrical section and at its other end to a liquid drain line carried through the piston of said first hollow cylindrical section, said pistons serving as valve means in that, in the first position of said piston, the liquid feed line and liquid drain line are open and upon movement of said pistons to a second position, said lines are closed, said apparatus comprising means for the displacement of said pistons from said first position to said second position.

4,276,770

RAPID OCTANE RATING

John M. Bittner, Princeton, N.J., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 27, 1979, Ser. No. 61,473
Int. Cl.[3] G01N *33/22*
U.S. Cl. 73—35 **14 Claims**



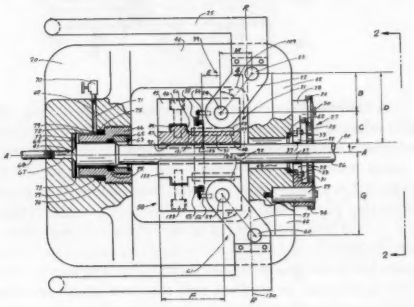
1. In the process for automatically determining the octane rating of a fuel by using the fuel to operate a test engine having a variable compression ratio, a knock intensity output signal, and automatic compensation means for automatically changing the compression ratio to compensate for knock intensity departures from standard and to do so in a predetermined relation to those departures, which process includes the steps of lowering the fuel-air ratio to bring the knock intensity below standard, then intermittently increasing the fuel-air ratio to determine when the knock intensity reaches a maximum, the improvement according to which the compression ratio is adjusted to bring the knock intensity to standard before the intermittent increases, then during the intermittent increases permitting automatic compensatory changes of the compression ratio in the downward direction only at a rate less than half that of said predetermined relation, and indicating the compression ratio reading after the knock intensity remains at the desired standard during two to four successive intermittent increases.

4,276,771

HYDROSTATIC TESTING APPARATUS

William E. Wesch, Jr., P.O. Box 94162, Houston, Tex. 77018

Filed May 8, 1979, Ser. No. 37,140
Int. Cl.[3] F16L *55/10*; G01M *3/28*
U.S. Cl. 73—49.8 **49 Claims**



9. A hydrostatic testing apparatus for capping an open end of a pipe, comprising:

a body having an interior zone, said body adapted to axially receive a pipe;

an arm pivotally connected to said body at a first pivot point, said arm having a second pivot point;

a jaw pivotally connected to said arm at the second pivot point, said jaw having a friction surface adapted for gripping the pipe, said friction surface operable to bear against an outside surface of the pipe when said arm is rotated in a first sense about said first pivot point;

a purge valve connected to said body;

a passageway, to place said purge valve in fluid communication with the interior zone of said body;

a seal axially positioned within said body and adapted to form a hydraulic seal between said body and the pipe to be capped, said seal having a first lip disposable against the interior surface of said body, and a second lip connected to said first lip and adapted to displace toward an outer surface of the pipe to be capped; and,

said seal having a plurality of lugs formed upon said second lip defining a plurality of interstices in fluid communication with said passageway.

4,276,772

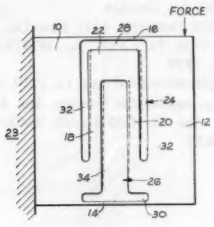
FORCE TRANSDUCER

Andrew C. Ferguson, Sutton Coldfield, England, assignor to W. & T. Avery Limited, West Midlands, England

Filed Oct. 3, 1979, Ser. No. 81,348
Claims priority, application United Kingdom, Feb. 24, 1979, 79 06621
Int. Cl.[3] G01L *1/22*
U.S. Cl. 73—862.62 **10 Claims**

1. A force transducer for force measurement, including a pair of loading members coupled together and constrained for relative movement in a predetermined direction by a first pair of flexure elements and a second pair of flexure elements arranged in spaced apart relation and extending alongside one another in their lengthwise directions and in the direction of relative movement between the loading members, each of said second pair of flexure elements having one end portion thereof rigidly united with a respective one of said loading members

the arrangement being such that, when the loading members are subjected to a force which tends to move them relatively in said predetermined direction, the second pair of flexure elements deflect laterally about their connections with the loading members, characterized in that said loading members and at least said second pair of flexure elements are all embodied in a single block of material.

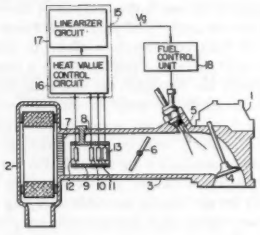


4,276,773

GAS FLOW MEASURING APPARATUS

Hisasi Kawai, Toyohashi; Tsuneyuki Egami, Aichi; Tokio Kohama, Nishio, and Hideki Obayashi, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 11, 1979, Ser. No. 102,352
Claims priority, application Japan, Feb. 22, 1979, 54-20010
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—204 **6 Claims**



1. A gas flow measuring apparatus comprising:

a gas flow measuring tube provided in a duct through which gas to be measured is flown;

an electric heater provided in said gas flow measuring tube;

a first temperature dependent resistor provided in said gas flow measuring tube on the downstream side of said electric heater;

a second temperature dependent resistor provided in said gas flow measuring tube at a position where there is substantially no thermal effect of said electric heater, said electric heater and said first and second temperature dependent resistors each including an insulator frame and a resistance wire stretched across said frame;

a temperature compensation resistance means provided in said gas flow measuring tube, and which exhibits a resistance value indicative of the temperature of said insulator frame; and

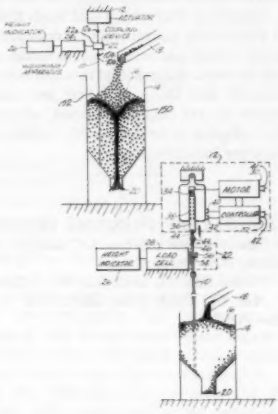
a measuring circuit connected with said electric heater, said first and second temperature dependent resistors and said temperature compensation resistance means, for controlling electric power to be supplied to said electric heater in accordance with resistance change of said first and second temperature dependent resistors so as to measure the amount of flow of gas to be measured, the control of power supply to said electric heater being corrected in accordance with the resistance value of said temperature compensation resistance means.

4,276,774

METHOD AND APPARATUS FOR MEASURING THE LEVEL OF SEMI-SOLID MATERIAL

Hugh R. McGookin, 9455 S. Friendly Woods La., Whittier, Calif. 90605, assignor to Hugh R. McGookin, Whittier, Calif.

Filed Jun. 8, 1979, Ser. No. 46,785
Int. Cl.³ G01F *23/20*
U.S. Cl. 73—290 B **18 Claims**



1. Apparatus for measuring the level of semi-solid material comprising:

a substantially uniform cable having a smooth outer coating for reducing drag on the cable;

means for suspending the cable vertically into the semi-solid material and for selectively introducing slack in the cable;

weighing apparatus; and

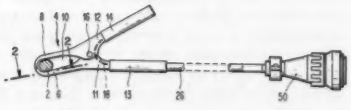
means for coupling a slackened portion of the cable above the level of the semi-solid material to the weighing apparatus, causing the weighing apparatus to weigh the slackened portion of the cable.

4,276,775

TEMPERATURE SENSOR FOR MEASURING THE TEMPERATURE OF A PART OF AN AUTOMOBILE

Robert Provasnik, Holland, Pa., assignor to Siemens Corporation, Iselin, N.J.

Filed Nov. 15, 1979, Ser. No. 94,439
Int. Cl.³ G01K *1/08, 7/22*
U.S. Cl. 73—346 **3 Claims**



1. In an automotive testing device having an easily removable temperature sensor for selectively measuring the temperature of various parts of an automobile, comprising:

(a) a clip for attachment to a selective one of said automobile parts, said clip having a first and a second curved jaw to more accurately measure the temperature, said jaws being movable between a first position, in which the jaws are positioned remote from each other, and a second position,

in which the jaws are positioned close to each other, thereby enclosing said automobile part;

(b) an extended recess extending along said first jaw and facing said second jaw;

(c) a thermistor having electrical leads, said thermistor being retained within said recess by a heat-conductive material and said electrical leads being arranged in said recess;

(d) first and second handles connected to the first and second jaw, respectively, wherein said first handle has a longitudinal axis and an opening formed along said axis for leading at least one electrical connecting lead therethrough; and

(e) an electric cable having at least one electrical connecting lead, wherein at least one of said leads from said thermistor is electrically connected to a connecting point being arranged within said recess, and wherein said connecting lead of the cable is conducted through said opening in said first handle and along said first jaw and is electically connected to said connection point, whereby the electric cable is adapted to be detachably connected to a remote temperature indicating device.

4,276,776

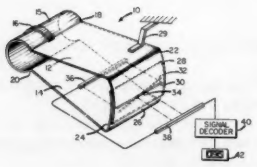
TEMPERATURE/PRESSURE TRANSDUCER

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jan. 17, 1980, Ser. No. 112,908

Int. Cl.³ G01K *5/64;* **G01L** *7/06, 9/00*

U.S. Cl. 73—363.7 **25 Claims**



1. An optical gauge comprising:

a sensing element adapted to produce movement in response to changes in a selected one of a fluid temperature and pressure to be measured;

a first surface having an indication means disposed thereon, said indication means being elongated in a longitudinal dimension;

a second surface movable relative to said first surface in a direction transverse of said longitudinal dimension, and having a second longitudinally elongated, indication means disposed thereon, said second surface and said first surface being in a confronting, overlapping relationship, said second indication means being disposed at an acute angle with respect to said first indication means and having a common point of intersection with said first indication means, the position of said point of intersection being indicative of a measurement of said selected one of a fluid temperature and pressure; and

linkage means connecting said second surface with said sensing element and adapted to cause transverse movement of said second surface relative to said first surface in response to movement of said sensing element to produce longitudinal movement of said common point of intersection.

4,276,777

APPARATUS FOR ANALYSING FLOWING MEDIA

Gustaf J. Sundkvist, Skelleftehamn; Fred O. Lundgren, Skellefteå; Mats-Ove R. Lindberg, Skelleftehamn, and Erik A. Boström, Skelleftea, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

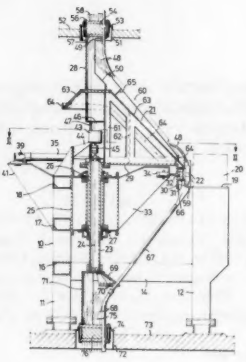
PCT No. PCT/US 79/00158, §371 Date Dec. 6, 1979, §102(e) Date Dec. 6, 1979, PCT Pub. No. WO79/00934, PCT Pub. Date Nov. 15, 1979

This PCT application filed Apr. 11, 1979, Ser. No. 174,526

Claims priority, application Sweden, Apr. 14, 1978, 7804262

Int. Cl.³ G01N *1/10, 23/00*

U.S. Cl. 73—864.81 **4 Claims**



1. An apparatus for use in the analysis of flowing media, and in particular for the analysis of pulp-flows taken from different locations in at least one flotation plant, in which apparatus analysis cells (**22**) through each of which a respective one of said media flows, are brought one at a time into a respective position for co-operation with an analysis instrument (**20**), particularly an X-ray analyser, which includes supply lines (**48**) by which the analysis cells can be connected to associated media sources; a stationary means (**12, 19**) for carrying said instrument; a movable means (**21**) for carrying said cells (**22**); means (**35, 36**) for setting the movable carrying means relative to the stationary means such that the cells are placed relative to the analysis instrument; and means (**66, 67, 68**) for collecting the media departing from said cells, characterized in that the movable carrier means (**21**) is rotatable about a substantially vertical axis (**24**) and carries the cells (**22**) adjacent to one another along a substantially horizontal circular-arcuate line which is concentrical with said axis; and that in an area located at a distance above the level of said cells the supply lines (**48**) extending from the sources of said media to said analysis cells comprise an elastomeric material and are joined to form a collected bunch (**49**) of lines comprising substantially vertically extending line-sections and arranged concentrically relative to said axis, from which bunch said lines extend obliquely downwardly and outwardly to respective associated analysis cells (**22**).

4,276,778

ANAEROBIC SAMPLING METHOD

Robert K. Ham, Madison, Wis., assignor to Getty Synthetic Fuels, Inc., Signal Hill, Calif.

Filed Feb. 21, 1980, Ser. No. 123,439

Int. Cl.³ G01N *1/04*

U.S. Cl. 73—864.43 **21 Claims**

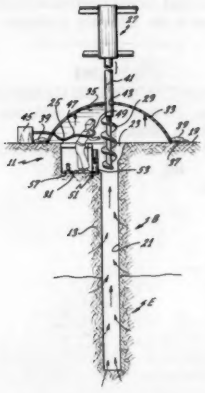
1. A method of obtaining a substantially anaerobic sample of refuse from a landfill comprising:

providing a bore hole in the landfill with the bore hole having an opening at the surface of the landfill;

substantially excluding atmospheric air from a zone which

includes at least a region of the bore hole to define an essentially anaerobic zone whereby air from the atmosphere is essentially excluded from said anaerobic zone;

loading at least some of the refuse into a sample container within the anaerobic zone to provide a sample within the sample container;



substantially sealing the sample container in the anaerobic zone so that the sample within the sample container is substantially sealed therein; and

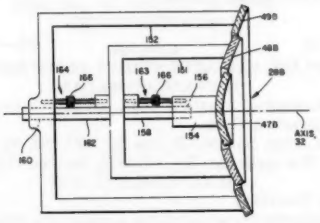
removing the sample container with the sample therein from the anaerobic zone.

4,276,779

DYNAMICALLY FOCUSSED ARRAY

Luther Davis, Jr., Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 29, 1979, Ser. No. 24,939
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—626 **7 Claims**



1. A dynamically focused radiant energy system comprising:

an array of fixed- focused radiators of radiation, each of said radiators having a different radius of curvature to provide a focus along an axis different from the others of said radiators;

a receiver for receiving signals of said radiators;

means for coupling said receiver to said array; and wherein

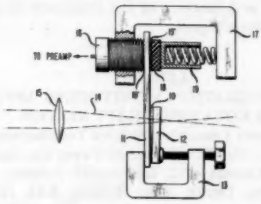
said coupling means includes means synchronized to the propagation of a signal of said radiation for coupling one or more successive said radiators to said receiver, said successive radiators being coupled to said receiver in the order of their increasing focal distance to cause the focal point to move in the same direction and in correspondence with the propagation distance of said synchronized radiation.

4,276,780

OPTOACOUSTIC SPECTROSCOPY OF THIN LAYERS

Chandra K. N. Patel, Summit, N.J., and Andrew C. Tam, Sunnyvale, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 29, 1979, Ser. No. 98,630
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—643 **14 Claims**



1. A method for high-sensitivity optoacoustic spectroscopy of samples of condensed matter in layer form, comprising

(a) selecting a solid substrate that consists at least in part of material essentially transparent to a probe radiation of frequency ν, at least part of the substrate being adapted to permit propagation therein of ultrasonic waves having frequencies much larger than a repetition frequency ν, the substrate containing a substrate source region, and, located to be nonoverlapping with that source region, a detection region, and the substrate source region being in intimate contact with at least part of the sample of condensed matter comprising a layer source region,

(b) irradiating the substrate source region and the layer source region with intermittent probe radiation of frequency ν, the repetition rate of the intermittent irradiation being ν_R,

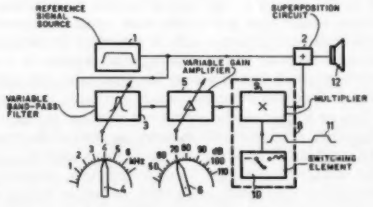
(c) detecting ultrasonic waves of frequencies much greater than ν_R that arrive at the detection region of the substrate after propagation through at least part of the substrate, whereby the absorption of the probe radiation of frequency ν in the sample layer can be determined.

4,276,781

METHOD OF AND ARRANGEMENT FOR ADAPTING A HEARING AID

Harald Leitner, Neubörnsen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 78,545
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1978, 2843923
Int. Cl.³ A61B *5/12*; H04R *25/00*
U.S. Cl. 73—647 **8 Claims**



1. A method of adjusting a hearing aid by means of a series of acoustic test signals of variable frequency and sound-level for determining the sound-level which is pleasing to the user of the hearing aid as a function of the frequency as compared to a reference sound-level range which is pleasing to persons with normal hearing abilities, after which the gain of the hearing aid as a function of the frequency may be changed so that the

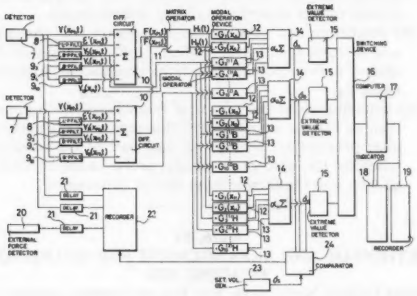
sound level found to be pleasing corresponds to the reference sound-level, the method comprising first presenting a wide-band reference signal of predetermined constant level to the user, adjusting the gain of the hearing aid so that the user just perceives the reference signal, subsequently presenting to the user a series of narrow-band test signals of at least 70 msecs. duration and with an interval therebetween of at least 150 msecs., the central frequency and sound level of said test signals being variable, and determining the pleasing sound level of said test signals as a function of the frequency at a constant level of the reference signal.

4,276,782

TORSIONAL VIBRATION MONITORING APPARATUS FOR ROTATING SHAFT SYSTEM

Ichiji Shima; Tatsuo Yamamoto; Shigeru Yoshibayashi; Hiroshi Teshima, all c/o The Kansai Electric Power Co., Inc., Technical Research Centers of 2, Ichinotsubo 1-chome, Wakaoji, Amagasaki City, Osaka; Akio Hizume, 8-11, Naka-machi 1-chome, Setagaya-ku, Tokyo; Tetsuo Iki, 1998-5, Yakoo-machi, Nagasaki City, Nagasaki Pref.; Takashi Yamamoto, 347, Motomurago, Tokitsu-cho, Nishisonogi-gun, Nagasaki Pref.; Kyozo Kanamori, 16-10, Shiraiwa-cho, Isahaya City, Nagasaki Pref.; Kenzo Noguchi, 5-24, Nameshi 6-chome, Nagasaki City, Nagasaki Pref., and Shinobu Kishikawa, 22-1, Hanaoka-machi, Nagasaki City, Nagasaki Pref., all of Japan

Filed Jun. 8, 1979, Ser. No. 46,912
Claims priority, application Japan, Jun. 9, 1978, 53/69498
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—650 **2 Claims**



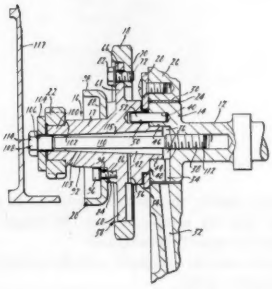
1. In a torsional vibration monitoring apparatus in which torsional vibrations at arbitrary positions of a rotating shaft system are measured by torsional vibrations detected at certain positions of the rotating shaft system on the basis of the fact that the torsional vibration produced in the rotating shaft system is an accumulation of modal vibrations thereof and that each modal vibration can be represented by a product of a vibration mode type and a vibration mode component, the improvement comprising n sets of detectors for detecting the torsional vibrations of the rotating shaft system at n certain positions thereof, decomposers for separating the respective torsional vibrations obtained by said detectors into respective (n+1)th or higher modal vibrations inherent to the rotating shaft system, subtractors for subtracting sums of the respective modal vibrations obtained by said decomposers from the modal vibrations obtained by said detectors, respectively, a matrix operator for multiplying the n vibrations having sums of the respective modal vibrations obtained by said subtractors with the previously obtained n sets of constants, each set including n constants, respectively, and adding them, respectively, to obtain up to the n-th vibration mode components, first modal operation devices for dividing the (n+1)th or higher modal vibrations at arbitrary ones of the certain positions by the vibration mode types at the arbitrary positions, respectively, and multiplying the vibration mode types at the arbitrary positions of the rotating shaft system to obtain respective (n+1)th or higher modal vibrations at the arbitrary positions, second modal operation devices for multiplying the up to the n-th vibration mode components obtained by said matrix operator with the vibration mode types at the arbitrary positions to obtain the up to n-th modal vibrations at the same positions and adders for adding the modal vibrations obtained by said first and second modal operation devices to obtain the torsional vibrations at the arbitrary positions.

4,276,783

LIGHTWEIGHT MOUNTED CAMSHAFT POST

Dale W. Anderson, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 21, 1979, Ser. No. 50,944
Int. Cl.³ F16H *37/12*
U.S. Cl. 74—15.63 **10 Claims**



1. A camshaft post assembly comprising:

a camshaft and a camshaft post connected thereto;

said camshaft post comprising a material having a specific gravity less than the camshaft;

said post mounted on the end of the camshaft and axially extending beyond the camshaft;

said post including a radially extending flange portion, a toothed sprocket ring attached about the outer periphery of said flange portion, and means for securing said post to said end of said camshaft.

4,276,784

STEPLESS, VARIABLE STROKE DRIVE HAVING A NON-ROTATING CAM

Clive Waddington, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Division of Ser. No. 836,727, Sep. 26, 1977, Pat. No. 4,181,043. This application Sep. 20, 1979, Ser. No. 77,205
Int. Cl.³ F16H *5/42, 5/60*
U.S. Cl. 74—336 R **1 Claim**

1. Apparatus for adjusting the position of a threaded shaft according to the speed of a rotating member, said shaft being rotatably fixed but axially movable comprising:

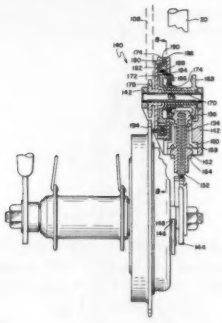
a support housing;

a pinion gear mounted for rotation within the housing and having a cylindrical portion extending axially therefrom, said cylindrical portion having an axially oriented concentric receptacle which is threaded to receive the threaded shaft in operative engagement;

an axle mounted for rotation in the housing about an axis transverse to the axis of the pinion gear, said axle adapted to receive the rotating member for rotation thereon;

first and second bevel gears mounted for rotation on the axle and positioned to engage opposite sides of the pinion gear, so that, when the first bevel gear drives the pinion gear, the threaded shaft extends and, when the second bevel gear drives the pinion gear, the threaded shaft retracts;

inner and outer clutch races separately mounted for rotation on the axle and each constructed with axially extending radially spaced opposing flanges, said inner race connected to the first bevel gear for rotation therewith and said outer race connected to the second bevel gear for rotation therewith; and



a centrifugal ring element constructed to radially expand or contract proportionally to speed, mounted on the rotating member for rotation therewith, said ring extending into the space between the flanges of the inner and outer clutch races and radially positioned therein to engage the inner race at relatively low rotational speeds and to engage the outer race at relatively high rotational speeds.

4,276,785

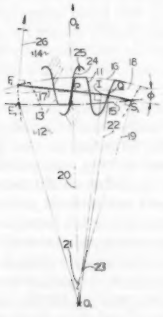
LOW-NOISE GEARING

William S. Rouverol, P.O. Box 9122, Berkeley, Calif. 94709

Filed Nov. 16, 1979, Ser. No. 94,798

Int. Cl.³ F16H *55/06*

U.S. Cl. 74—462 **16 Claims**



1. A pair of mating gears that are not preloaded, are mounted on coplanar axes, and have conjugate teeth formed to make contact, when said gears are transmitting torque, over a transverse plane path of contact that affords a ratio of roll angle to pitch angle of at least 2.5,

said path being non-straight and having an average pressure-angle smaller than 14°.

4,276,786

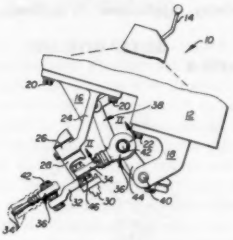
BOOT SEAL

Joseph G. Langenstein, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 5, 1979, Ser. No. 127,997

Int. Cl.³ G05G *7/00*; F16C *11/06, 33/72*

U.S. Cl. 74—491 **10 Claims**



1. In a joint assembly **(36)** including a joint **(60)** for connecting a first member **(50)** to a second member **(42)** extending transversely therethrough, the first member **(50)** having an end portion **(52)**, a stem **(58)**, and first and second side portions **(54,56)**, the improvement comprising:

a boot seal **(48)** encompassing the joint assembly **(36)**, the seal **(48)** including a cylindrically shaped body portion **(76)** disposed over the end **(52)** of the first member **(50)**, a flexible portion **(82)** extending along the stem **(58)**, a plurality of apertures **(86)** in the body portion **(76)** positioned adjacent the first and second sides **(54,56)** for receiving the second member **(40)**; and

means **(42,100,102)** for releasably coupling the seal **(48)** to the joint assembly **(36)**.

4,276,787

STEERING DEVICE FOR A CYCLE

Andrew Kellner, 92 Cardigan St., Stanmore, New South Wales 2048, Australia

Filed Jul. 27, 1979, Ser. No. 61,342

Claims priority, application Australia, Aug. 23, 1978, PD5638

Int. Cl.³ B62K *21/00, 21/12, 21/16*

U.S. Cl. 74—552 **4 Claims**

1. A steering arrangement for a bicycle having a steering shaft, said arrangement comprising:

(a) a steering wheel consisting of a first section defining a portion of the circumference of a circle and a second part generally defining a cord of said circle, with said second part subtending an angle with respect to said circle which is smaller than the angle subtended by said first part;

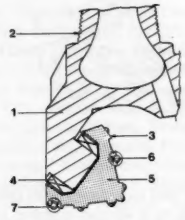
(b) a generally U-shaped member attached at its extremities to said wheel at spaced locations adjacent the juncture of said first and second parts of said wheel, and extending from the general plane of the wheel to enable attachment of said member to said shaft; and

(c) a clamp to adjustably attach said member to said shaft to enable pivoting of said wheel about an axis transverse of the bicycle.

4,276,788
PROCESS FOR THE MANUFACTURE OF A DRILL HEAD PROVIDED WITH HARD, WEAR-RESISTANT ELEMENTS

Hans B. van Nederveen, Zeist, Netherlands, assignor to SKF Industrial Trading & Development Co. B.V., Nieuwegein, Netherlands

Filed Mar. 17, 1978, Ser. No. 887,931
Claims priority, application Netherlands, Mar. 25, 1977, 7703234
Int. Cl.³ B21K 5/02
U.S. Cl. 76—108 A 4 Claims



1. In a process for manufacturing a drill head having a core part with hard wear-resistant cutting elements each cutting element comprising a shank part embedded in said core part and a cutting tip at one end of the shank part that projects outward from the surface of said core part, the process comprising the steps:

(a) filling with a metal powder a compressible mold which generally defines said core part,

(b) forming the shank of each said cutting elements so that its diameter at at least one point along its length is greater than its diameter at some other point along its length,

(c) embedding the shank part of each of said cutting elements in said powder,

(d) locating said shank parts of said cutting elements in said powder in the mold in essentially exactly the final position they will have after said step of compacting,

(e) cold isostatically compacting said mold and included powder and embedded shank parts thereby precisely forming said drill head are precisely locating said cutting elements therein, and

(f) removing said drill head from said mold, and subsequently hot isostatically compacting said drill head until said powder is completely densified.

4,276,789
CORK EXTRACTOR

Herbert Allen, Houston, Tex., assignor to Hallen Company, Houston, Tex.

Filed Jul. 17, 1978, Ser. No. 925,365
Int. Cl.³ B67B 7/00
U.S. Cl. 81—3.36 32 Claims

23. Apparatus for extracting a cork from a bottle comprising:

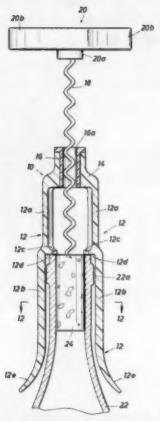
a holder including

guide means having a guide passageway extending generally longitudinally therethrough and having generally radially facing guide surface means;

stop means engageable with the bottle to limit downward movement of said holder with respect to the bottle; and

grip means connected to and spaced downwardly from said guide means and engageable with the bottle to radially align said guide means with the bottle; and

a cork-engaging member including a generally helical corkscrew, for at least partial passage into the cork and longitudinally movable in said guide passageway, selectively with or without simultenaous rotation and having a diameter sized to lie closely adjacent said guide surface means,

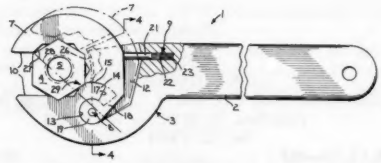


said corkscrew comprising a central body and an outer layer of friction reducing material.

4,276,790
OPEN-ENDED WRENCH HAVING RATCHETING ACTION

Brian L. Davis, 610 Newbury, Ripon, Wis. 54971

Filed May 16, 1979, Ser. No. 39,644
Int. Cl.³ B25B 13/28
U.S. Cl. 81—111 8 Claims



1. A ratcheting open-ended wrench for turning of a drive head such as a nut or bolt head, comprising an operating handle having a fixed jaw fixedly secured to one end thereof, said fixed jaw extending outwardly and laterally to define one side of a drive head opening, a pivoted jaw including a base portion pivotally connected to the fixed jaw in alignment with the fixed jaw and extending laterally across the end of the handle and extending outwardly from said base portion to the opposite side of the handle to define the base portion and opposite side of the drive head opening, said pivoted jaw being spaced from said fixed jaw to define an entrance to said drive head opening and said fixed and pivoted jaws having notched surfaces including at least one notch in each of said fixed jaw and said base portion and said opposite side of said pivoted jaw and complementing a correspondingly shaped drive head, whereby said drive head opening is oriented with said entrance essentially aligned with the operating handle and said pivot position is located to one side of said drive head opening, each of said fixed jaw and said movable pivoted jaw include a plurality of substantially V-shaped adjacent notches, each notch of which consists of a pair of similar planar surfaces and defining a first plurality of interrelated equicircumferentially spaced notches and a second identical plurality of interrelated equicircumferentially spaced notches interposed in offset orientation with respect to each other to define an opening in accordance with a six-sided drive head whereby the drive head is adapted to be

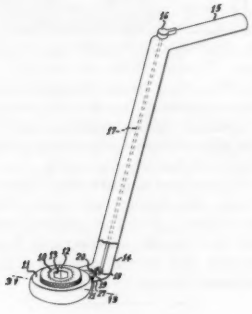
positioned in two alternate positions within the opening, said notches being located and oriented within the pivoted jaw to include an outermost notch forming the outermost of said first plurality of notches and an immediately adjacent inner notch forming the outermost of the second plurality of notches, each of said outermost notches being oriented and constructed such that in the closed jaw position the head engaging surface of each of the outermost notches is perpendicular to a line from the notch which passes inwardly of the pivot axis.

4,276,791

DISTRIBUTOR RATCHET WRENCH

John W. Thompson, 951 Mikael Ave., Jacksonville, Fla. 32205

Filed Jun. 1, 1979, Ser. No. 44,599
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—62 **1 Claim**



1. A ratchet wrench for use in tightening or loosening nuts or bolts in remote locations which are difficult to reach, said wrench comprising a socket wrench head, and a ratchet means mounted on said head capable of rotating said head with a ratchet movement clockwise or counterclockwise and capable of being locked to prevent ratchet movement of said head, a generally horizontal member connected to and extending laterally from said wrench head, means mounted on said horizontal member to engage and disengage said ratchet means, a generally elongated vertical extension connected at its lower extremity to said horizontal extension, a generally horizontal handle extension connected to the upper extremity of said vertical extension, and a control means having a control element on one of said extensions remote from said wrench head and closely adjacent to the upper extremity for selectively controlling the direction of rotation of ratchet movement or the locking to prevent ratchet movement, said control means including a control knob adjacent said upper extension and a vertical element extending substantially the length of said vertical extension and operatively connecting between said control knob and said means mounted on said horizontal member thereby controlling said ratchet means, said horizontal member and both of said extensions form a Z-shaped handle and support for said wrench head, said wrench head being adapted to fit the clamp of a distributor of a internal combusion engine and said vertical extension locating said handle extension above the top of said distributor for ready selection between the ratchet positions without removal of said wrench head from said clamp.

4,276,792

METHOD FOR CONTINUOUS PATH CONTROL OF A MACHINE TOOL

Herbert Strobel, Oberndorf, Fed. Rep. of Germany, assignor to Heckler & Koch GmbH, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,399
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1977, 2742933
Int. Cl.³ B23B *3/00*
U.S. Cl. 82—1 C **4 Claims**

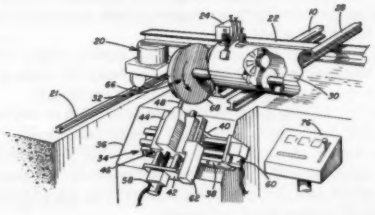
1. A method for the continuous path control of a machine tool, the workpiece and tool of which are moved by actuators relative to each other along a curve to produce a given contour, with the curve being approximated by a plurality of calibrated and stored set points between which set points the motions are performed by an interpolator determining the actual position of said tool and workpiece and a controller providing an input displacement pulses to said actuators for movement to the next succeeding point and where intermediate point scanning is effected, followed by an intermediate point/actual value comparison with a corresponding correction value input to the actuators characterized in that intermediate point scanning is carried out after a given sum of interpolator displacement pulses have been received by the actuators.

4,276,793

METHOD AND APPARATUS FOR TRUING A METAL WHEEL, ESPECIALLY OF A RAILROAD LOCOMOTIVE OR OTHER ROLLING STOCK

Arthur T. Wirtz, 105 Sharon Dr., Pittsburgh, Pa. 15221

Filed Jul. 5, 1979, Ser. No. 54,803
Int. Cl.³ B23B *3/00, 5/28*
U.S. Cl. 82—1 C **14 Claims**



1. In a method of truing metal wheels of railroad locomotives and other rolling stock having a traction motor for driving a locomotive wheel to be trued wherein the locomotive or other rolling stock is moved into position on rail sections extending over an open pit, the locomotive or other rolling stock is lifted from the rail sections and the rail sections are removed to provide access to the wheel to be trued from the pit, the improvement comprising the steps of:

A. connecting an independent power source to the traction motor and thereby driving a wheel to be trued at a controlled speed with the traction motor;

B. removing metal from said wheel as it is driven with a cutting tool mechanism provided in the pit; and

C. controlling said mechanism in accordance with a preestablished pattern to cause the cutting tool to move across the driven wheel to remove metal to form a wheel contour corresponding to said pattern.

4,276,794

TOOL MACHINE FOR MACHINING CRANKSHAFTS AND A METHOD OF OPERATION THEREOF

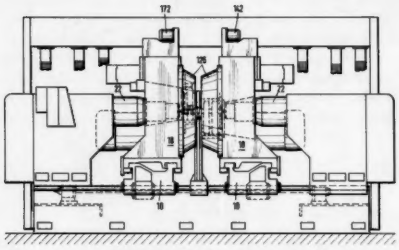
Hermann Berbalk, Göppingen, Fed. Rep. of Germany, assignor to Gebrüder Boehringer G.m.b.H., Fed. Rep. of Germany

Continuation-in-part of Ser. No. 876,867, Feb. 10, 1978, abandoned, which is a division of Ser. No. 741,519, Nov. 12, 1976, Pat. No. 4,090,422. This application Nov. 16, 1979, Ser. No. 94,948

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1975, 2551250

Int. Cl.[3] B23B *1/00, 5/18*

U.S. Cl. 82—1 C 6 Claims



1. A machine tool for simultaneously machining a pair of crankshaft sections comprising a frame, means on said frame for holding said crankshaft in stationary condition, a pair of parallel guideways extending transversely to said crankshaft at equal distances therefrom, and a pair of tool units one movably mounted on each of said guideways, each tool unit comprising

(a) a cross-slide on each of said guideways;

(b) an eccentric body journalled in said cross-slide for rotation about a first axis;

(c) an annular tool having internal cutting edges, said tool being journalled in said eccentric body for rotation about a second axis and surrounding said crankshaft;

(d) first driving means for imparting rotation to said annular tool determining the cutting speed of said edges;

(e) second driving means for imparting a plunging feed motion to said cross-slide on said guideway to a position in which said first axis coincides with the axis of the crankshaft section being machined;

(f) third driving means for imparting a revolution to said eccentric body causing said annular rotary tool to orbit around said crankshaft section;

(g) adjustable controlling means responsive to said feed motion and operative, when the feed motion has caused said annular tool to plunge into said crankshaft held in stationary condition to an adjustable depth to stop said cross-slide and to start said third driving means of both tool units to impart revolution to said eccentric bodies of said tool units in the same direction and with the same velocity;

the second driving means of one tool unit and said second driving means of the other tool unit being operative to impart the feed motion to the respective cross-slides of said units in opposite directions thus causing said annular tools of said tool units to plunge into opposite sides of said crankshaft and to start on opposite sides of said crankshaft to orbit therearound.

4,276,795

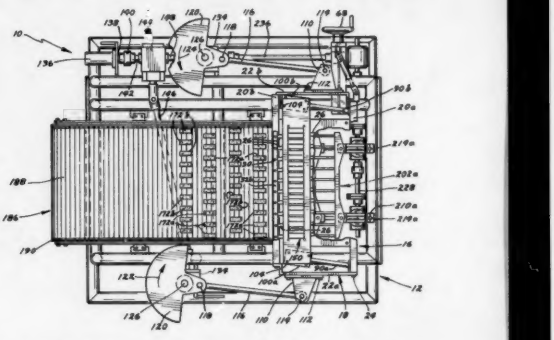
FISH STICK CUTTING METHOD AND APPARATUS

Glenn Rasmussen, Champlin; Larry Huston, Buffalo, both of Minn.; Donald W. Morse, Rowley, Mass.; Takuzo Tsuchiya, St. Louis Park, Minn.; Clifton H. Morrison, St. Paul, Minn.; Stanley C. Rustad, Golden Valley, Minn., and Leo Eiden, New Hope, Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Jul. 26, 1979, Ser. No. 60,952

Int. Cl.[3] B26D *1/06*

U.S. Cl. 83—42 61 Claims



1. A method of severing frozen slabs of fish or the like into individual sticks comprising the steps of arranging a pair of said slabs in a generally parallel relation, cutting in one direction and in one plane a first stick from the end of one of said slabs, providing a substantially rigid surface in a second plane parallel to and spaced from said one plane, abutting one end of the other of said slabs against said rigid surface, and then cutting in said one plane and in a second direction substantially opposite to said first direction a second stick from the other of said slabs, whereby said second stick has a thickness determined by the distance between said planes.

4,276,796

APPARATUS FOR CUTTING TO LENGTH THE CONNECTING WIRES OF ELECTRICAL COMPONENTS

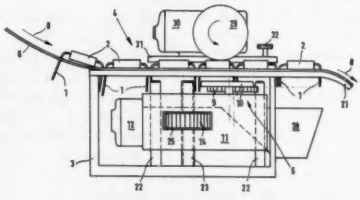
Thomas Weresch, Greschbachstr. 19, D-7500 Karlsruhe 41, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,515

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814182

Int. Cl.[3] B26D *1/24*

U.S. Cl. 83—167 17 Claims



1. Apparatus for cutting to length connecting wires of electrical components, comprising a component guide and a cutting device arranged below the component guide, wherein the component guide comprises a slideway defining a guide slot through which the connecting wires can project downwardly, the cutting device comprises two shearing wheels which are each provided with a peripheral cutting edge and at least one of which is capable of being driven in rotational movement, the

shearing wheels having peripheral cutting edges and being arranged one above the other and having facing surfaces abutting on one another and partly overlapping one another so as to form two points of intersection of the peripheral cutting edges, a forward one of said points of intersection, in the direction of rotation of the driven shearing wheel, being situated below the guide slot, and means, engageable with said electrical components, for holding and conveying said electrical components during cutting of said connecting wires, said means for holding and conveying being operable to convey said electrical components in a direction parallel to said guide slot, wherein said means for holding and conveying comprises a conveying roller which is situated above the guide slot in the region of the shearing wheels and is operable to be driven in rotational movement about an axis across the guide slot perpendicular to the slot plane with a circumferential surface arranged for uniformly engaging and conveying said electrical components in a straight line, and wherein the conveying roller is formed of a soft foamed plastic material whereby said roller is inherently adaptable to configurational variations of said components.

4,276,797

APPARATUS FOR DISPENSING SHEETS OF WEB MATERIAL OF PREDETERMINED LENGTH

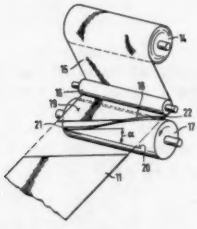
Manfred Baumann, and Walter Besserer, both of Diepoldsau, Switzerland, assignors to APURA GmbH, Mainz-Kostheim, Fed. Rep. of Germany

Division of Ser. No. 897,453, Apr. 18, 1978, Pat. No. 4,186,633. This application Jun. 1, 1979, Ser. No. 44,745

Claims priority, application Switzerland, Apr. 19, 1977, 4859/77

Int. Cl.³ B26D *1/56*; A47K *10/36*

U.S. Cl. 83—308 **11 Claims**



1. An apparatus for dispensing sheets of web material of predetermined length from a supply of the web material comprising:

a housing,

means for storing the supply of web material in the housing, and

separating means arranged in the housing for separating a sheet of the web material from the remainder thereof in response to a user of the apparatus pulling from the housing the free end of web material in the storing means,

the separating means comprising a roller mounted for rotation in the housing, means for guiding the free end of the web over the roller and into frictional driving engagement therewith as it is pulled from the housing, and cutting means arranged on the surface of the roller to provide a cutting line at least part of which extends at an angle other than zero to the axis of the roller such that when a sheet of the web is withdrawn by the user a portion of the leading edge of the remainder of the web is simultaneously advanced outside the housing solely as a direct result of such withdrawal to be available for gripping by a subsequent user.

4,276,798

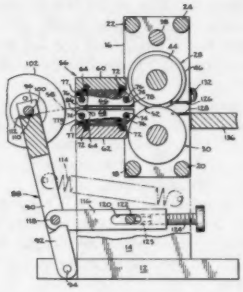
FLAT CABLE CONDUCTOR SEPARATING APPARATUS

Klaus W. Gottschalk, 934 Heatherstone Way, Sunnyvale, Calif. 94087

Filed Nov. 23, 1979, Ser. No. 96,616

Int. Cl.³ B26D *1/24*

U.S. Cl. 83—430 **7 Claims**



1. In a conductor separator for separating conductors of a flat cable that has plural conductors and insulation material for retaining the conductors in uniformly spaced apart parallel relation, the insulation forming webs of reduced thickness between adjacent conductors so as to define longitudinally extending slots, the separator being of the type having means for shearing the webs at plural spaced apart sites corresponding to the location of the webs, improved apparatus for guiding the cable toward the shearing sites in precise alignment therewith comprising a first body having a plurality of parallel elongate ribs that are spaced from one another by an integral multiple of the distance between adjacent slots in the cable, a second body having a plurality of parallel elongate ribs identical in spacing and location to the ribs in said first body and means for mounting said bodies so that said ribs of said bodies confront one another to define a path to said sites, said ribs being aligned with said sites, said mounting means including means for yieldably biasing said bodies and said ribs toward said path.

4,276,799

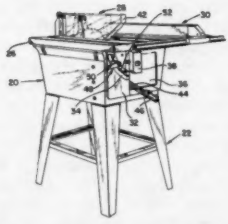
POWER TOOL APPARATUS

Anthony A. Muehling, Detroit, Mich., assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 18, 1979, Ser. No. 31,271

Int. Cl.³ B27B *5/24*

U.S. Cl. 83—473 **53 Claims**



3. A power tool apparatus comprising:

a housing including a tabletop having an opening through which a motor-driven tool can pass;

assembly means pivotally mounted in said housing about a first pivot axis, said assembly means including,

pivot means defining a second pivot axis and fixedly connected to said assembly means,

subassembly means pivotally mounted on said pivot means and including the tool,

first control means including,

a control lever operatively connected to said subassembly means for pivoting same about said second pivot axis, whereby the tool is raised or lowered in said opening to a first elevation with respect to the table-top in a relatively quick setting manner, and locking means for securing said control lever at a position corresponding to said first elevation setting for the tool,

said locking means proximately disposed to said control lever such that both are manipulatable by the same hand of the operator, without removing the hand from said lever throughout the complete elevation setting operation, and,

second control means operatively connected to said subassembly means for pivoting said subassembly means about said second pivot axis independently of said control lever to provide a further elevation adjustment of the tool,

said second control means proximately disposed to said control lever such that said second control means is manipulatable by the same hand of the operator without removing the hand from said lever throughout the complete elevation setting operation; and,

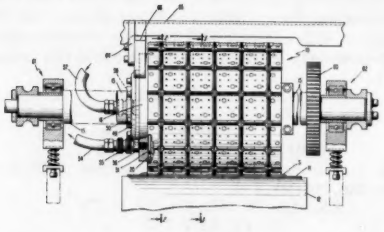
means for pivoting said assembly means about said first pivot axis, whereby the angle of the tool relative to said table top is varied.

4,276,800

ROTARY CUTTER FOR SCORING DOUGH SHEETS

Daniel A. Koppa, Bloomfield, and Agostino J. Aquino, Paterson, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Filed Apr. 16, 1980, Ser. No. 140,956
Int. Cl.³ A21C *11/00*
U.S. Cl. 83—863 **4 Claims**



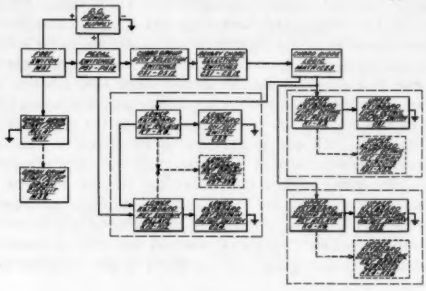
1. A rotary cutter assembly for cutting and scoring a sheet of dough for producing crackers of the like with clipped corners, said assembly comprising in combination a drum, a plurality of cruciform shaped members arranged upon the face of said drum, each cruciform member having four arms and a center portion at the junction of said arms, said center portion having a dough cutting egge defining an enclosed area to cut from the dough sheet a piece of dough having the shape of the enclosed area, said arms each having a dough scoring edge running outwardly from said dough cutting edge, said cruciform members being arranged so that said arms are positioned along intersecting lines with the center portions positioned at the intersections of said lines, means for applying a vacuum to said center portions to hold the cut dough pieces within the center portions and lift them from the dough sheet, means for applying a positive pressure to said center portion to expell said dough pieces, and means for receiving the dough pieces and carrying them away from the dough sheet.

4,276,801

PEDAL ACTUATED MUSICAL CHORD SYSTEM

Joseph A. Yerussavage, 1425 W. 4th La., Hialeah, Fla. 33012

Filed Nov. 19, 1979, Ser. No. 95,228
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **13 Claims**



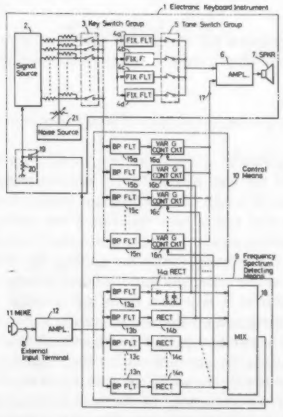
1. Apparatus for generating selected chords in response to foot pedal actuation for use with an electronic musical instrument having note generating means, comprising logic means associated with said note generating means, said logic means having a plurality of input terminals, each of said input terminals producing a chord containing preselected notes upon energization thereof; a plurality of foot pedals; first switch means associated respectively with each of said foot pedals and actuated by depression thereof for energizing said logic means; and second switch means associated respectively with each of said foot pedals for permitting selection of which one of said logic means input terminals said first switch means shall energize; whereby a user can select which one of a plurality of chords will be generated upon depression of each of said pedals.

4,276,802

ELECTRONIC KEYBOARD INSTRUMENT

Fumio Mieda, Sakado, Japan, assignor to Keio Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1979, Ser. No. 26,515
Claims priority, application Japan, Apr. 3, 1978, 53/38943
Int. Cl.³ G10H *1/12, 5/00*
U.S. Cl. 84—1.19 **10 Claims**



1. An electronic keyboard instrument wherein note signals each containing a pitch frequency and harmonics respectively

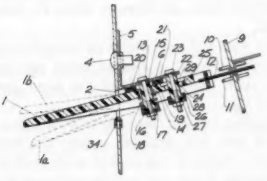
corresponding to keys of a keyboard are selectively generated from an internal signal source by depressing the keys and musical tones corresponding to the generated note signals from the internal signal source are reproduced, the electronic keyboard instrument comprising: an external input terminal for supplying thereto an external sound signal; frequency spectrum detecting means coupled to said input terminal and having band-pass characteristics at predetermined center frequencies for detecting the spectrum components and their levels of the external sound signal which approximately represent the tone color of the external sound signal; bandpass filter means, having center frequencies respectively corresponding to the center frequencies of the spectrum detecting means, for separately extracting the spectrum components of note signals generated from the internal signal source; and level control means for controlling, with the respective levels of the spectrum components detected by said frequency spectrum detecting means, the levels of the respectively corresponding spectrum components of the note signals extracted by the bandpass filter means at the respective center frequencies, thereby to reproduce musical tones each of which has a tone color similar to that of the external sound signal.

4,276,803

STOP TAB FOR CAPTURE COMBINATION ACTION SYSTEMS USED IN ELECTRONIC ORGANS

William L. Fritz, Cincinnati, Ohio, assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio

Filed Feb. 14, 1980, Ser. No. 121,539
Int. Cl.³ G09B *15/02*; G10B *3/10*
U.S. Cl. 84—343 **9 Claims**



1. A stop tab mechanism for an electronic organ, said stop tab mechanism comprising an elongated stop tab having a front portion, a central portion, and a rear portion, a mounting bracket for said stop tab, spaced apart front and rear rests secured to said mounting bracket, guide means mounting the central portion of said stop tab for pivotal movement relative to said rests, including spring means urging the central portion of said stop tab into contact with said front and rear rests, switch means operatively connected to the rear portion of said stop tab, said stop tab having a "neutral" position in which its central portion is seated against both of said rests and held in engagement therewith by said spring means, an "on" position in which the front portion of the stop tab is depressed, the stop tab pivoting about said rear rest to move its rear portion upwardly, and an "off" position in which the front portion of the stop tab is elevated, the stop tab pivoting about the said front rest to move its rear portion downwardly, said spring means acting to return said stop tab to its "neutral" position when the stop tab is released.

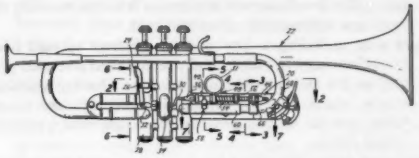
4,276,804

PITCH ADJUSTER FOR VALVED BRASS INSTRUMENTS

Jack O. Holland, 3314 W. End Ave., Nashville, Tenn. 37203

Filed Jun. 11, 1979, Ser. No. 47,143
Int. Cl.³ G10D *9/00*
U.S. Cl. 84—394 **9 Claims**

1. A valved brass instrument with a tuning slide crook with means for selectively adjusting the pitch of the note as the instrument is played including a main push rod, means connecting said main push rod to the tuning slide crook, means to controllably retract or extend said main push rod from a center position to thereby retract the tuning slide crook from its tuned position or extend the tuning slide crook from its tuned posi-



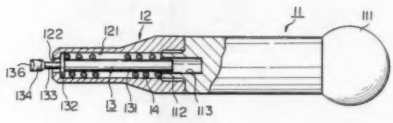
tion, respectively, and adjustable detent means to limit the travel of said main push rod and provide a preselected retracted, center, and extended position, thereby enabling play in the just intonation scale, said adjustable detent having means to lock the main push rod in said center position for tuning.

4,276,805

COVERING WIRE TIGHTENING DEVICE COMPOSITE STRINGS OF PIANOS

Yasutoski Kaneko, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jul. 26, 1979, Ser. No. 60,975
Claims priority, application Japan, Jul. 29, 1978, 53-104946[U]
Int. Cl.³ G10G *7/00*; G10D *3/14*
U.S. Cl. 84—458 **7 Claims**



1. A covering wire tightening device for composite strings of pianos comprising:

an elongated cylindrical main body open in one end thereof, and

a spring-loaded operating shaft axially movably encased within said main body with one end portion being axially exposable out of said main body via said open end, the free end of said one end portion being adapted for engagement with the top of a frame pin, said one end portion being made up of a first section which includes said free end and a second section which is remote from said free end, and said first section being larger in cross-sectional diameter than said second section.

4,276,806

SELF-RETAINED AND REUSABLE FASTENER

Henri Morel, Maule, France, assignor to ITW de France, Beauchamp, France

Filed Jul. 9, 1979, Ser. No. 55,713
Claims priority, application France, Jul. 13, 1978, 78 21054
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—41 **9 Claims**

1. A fastening assembly including a one piece self-retained reusable plastic fastener in combination with at least a pair of elements to be fastened together including

an apertured first element wherein said aperture has a first predetermined extent,

an apertured second element wherein said aperture has a second predetermined extent less than said first predetermined extent and recess means which has a third diametral extent greater than said first predetermined extent and

forming shoulder means spaced a predetermined distance from a surface of said second element,

said fastener including a male member and a female member initially joined by a frangible means in coaxial relationship

said female member including a head and a stud extending integrally therefrom with a common bore transversing the head and substantially all of said stud,

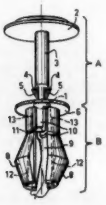
said stud including a first portion adjacent to said head complimentary to said second aperture and a second portion at the end opposite said head and having shoulder means intermediate its extremities, said shoulder means being greater in measurement than said first predetermined extent

said stud being bifurcated by at least one slot throughout substantially its entire axial extent, and forming at least two flexible tabs,

groove means extending axially within the base of said bore but terminating abruptly in spaced relationship to said head to form a shoulder facing away from said head,

at least one spring strip integral at one end with said head and extending axially within said at least one slot, said strip having a laterally extending shouldered lug at its opposite end and spaced from said head a distance substantially equal to the distance of said recess means from the surface of said second element,

said male member including a rigid locking stem having manipulation means at one end and initially connected coaxially by frangible means to the head of said female member at its opposite end,



at least one resilient retaining strip extending outwardly from said stem adjacent said opposite end and positionable within a stem recess when said stem is axially driven into said bore through said female head, said at least one strip being aligned with and complimentary to the groove means within said bore,

whereby the first portion of the stud of said female member can be telescopically assembled into the aperture of said second element until said lugs interlock with said recess means, said second portion having shoulder means being then positioned within the aperture of said first element, an axial force against manipulation means of said locking stem causes said frangible means to fracture, said retaining strips collapse inwardly during passage of said stem through said bore until they pass said groove shoulder and are adapted to then expand to lie within said groove and permit non-rotatable axial movement of said stem to a position for locking said lug carrying spring strip within the recess of said second element and said shouldered second portion within the aperture of said first element,

an oppositely directed axial force on said manipulation means causes said locking stem to be retracted through said head until the free ends of said retaining strip contacts said shoulder in said groove thereby permitting removal by inward flexing of said second portion of the stud tabs from said first apertured element, while retaining said first portion in assembled locked relationship with said second element reassembly with said first element being possible by reversal of the procedure.

4,276,807

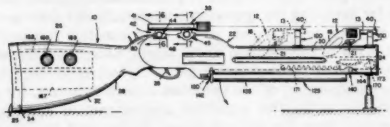
RIFLE BATON

Ben H. Whitlock, 137 Cedarhurst St., Islip Terrace, N.Y. 11752

Filed Aug. 10, 1979, Ser. No. 65,721

Int. Cl.³ F41C *23/00*

U.S. Cl. 89—37 BA **20 Claims**



1. A support assembly for hand gun comprising in combination:

A. a rifle-like unit having a front end and spaced body-engaging rear end, with an upper end and lower end intermediate said front and rear ends,

B. sighting means for use with the support assembly,

C. mounting means for removably securing said sighting means relative to said upper end so as to obtain adjustment thereof as desired,

D. coupling means associated with said upper end and adapted for receiving a hand gun in removably coupled relation thereto adjacent to said front end when in assembled position with the support assembly,

E. said coupling means includes:

(1) a seat formed on said upper end adapted to receive the butt of the hand gun to be contained therein,

(2) said seat having a bottom wall adapted to have the free end of the butt rest thereon when the hand gun is positioned,

(3) a first wall and a second wall extending upwardly from said bottom wall in spaced apart relationship to each other such that the butt of the hand gun is contained within said seat,

(4) engaging means associated with either said first or second wall for yieldably urging the butt into contact with the opposite one of said walls such that removable retainment of the butt within said seat is obtained,

F. holding means mounted intermediate said coupling means and said front end for maintaining the barrel of the hand gun in fixed position during use thereof, and

G. said holding means including a vertically extending channel having a resilient arm associated therewith for maintaining the barrel in removably positioned confinement within said channel.

4,276,808

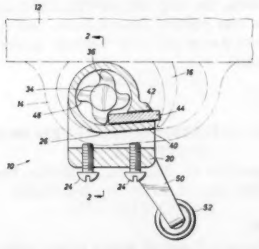
ATTACHMENT FOR FIREARMS

Norman N. York, 3703 Broadway, Houston, Tex. 77017

Filed Aug. 27, 1979, Ser. No. 70,143

Int. Cl.³ F41C *19/00*

U.S. Cl. 89—136 **7 Claims**



1. An apparatus for use with a semiautomatic firearm having a trigger enclosed within a trigger guard, comprising:

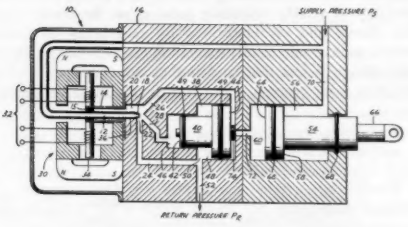
(a) clamp means adapted to be releasably attached to a trigger guard;
(b) rotor means pivotally supported by said clamp means;
(c) manually operated handle means connected to said rotor means for rotation on hand operation to impart rotation to said rotor means; and
(d) movable striker means supported by said clamp means and positioned to move toward a trigger and contact thereagainst to discharge the firearm through operation of the trigger, said striker means moving on operation of said rotor means.

4,276,809

SIMPLIFIED FAIL-FIXED SERVOVALVE

Howard B. Kast, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 23, 1979, Ser. No. 32,577
Int. Cl.³ F15B *15/17, 13/044*
U.S. Cl. 91—417 R **3 Claims**



1. A fail-fixed electrohydraulic servovalve for use with a piston translatably disposed within a bore, the servovalve comprising means for maintaining the piston in a fixed position for electrical input signals which are less than a first predetermined percent of a maximum rated electrical input signal, for causing the piston to translate in a first direction for electrical input signals which are greater than said first percent but less than a second predetermined percent of said maximum rated electrical input signal, for maintaining the piston in a fixed position for electrical input signals which are equal to said second percent of said maximum rated electrical input signal, and for causing the piston to translate in the second direction for electrical input signals which are greater than said second percent of said maximum rated electrical input signal.

4,276,810

PROGRAMMED VALVE SYSTEM USED FOR POSITIONING CONTROL

Kenneth W. Zeuner, Newtown, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Continuation-in-part of Ser. No. 578,006, May 16, 1975, Pat. No. 3,980,002, and Ser. No. 723,023, Sep. 13, 1976, Pat. No. 4,202,250, said Ser. No. 578,006, is a continuation of Ser. No. 304,816, Nov. 8, 1972, abandoned, said Ser. No. 723,023, is a continuation-in-part of Ser. No. 578,006,. This application Oct. 14, 1977, Ser. No. 842,264
Int. Cl.³ F15B *13/043*
U.S. Cl. 91—449 **8 Claims**

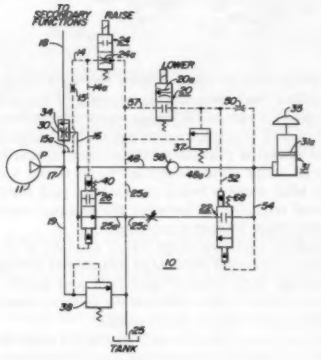
1. A programmed valve system in combination with load means and a fluid source having a raise and a lower two-stage valve assembly comprising

said raise two-stage valve assembly comprising a raise first solenoid operated pilot stage maintained normally open during the rest state, a raise second stage divided into inlet and outlet sections, a raise second stage orifice between the sections within which a raise second stage poppet reciprocates,

said lower two-stage valve assembly comprising a lower first solenoid operated pilot stage maintained normally closed during the rest state, a lower second stage divided into inlet and outlet sections, a lower second stage orifice between the sections within which a lower second stage poppet reciprocates,

said raise and lower second stage poppets each having an outer substantially parabolic contour to provide a predetermined flow area between the respective orifice and parabolic contour, said first raise and lower pilot stages being respectively coupled to said raise and lower second stages only by fluid communication for normally maintaining the respective second stages opened and closed and whereby said respective raise and lower second stage poppets are controlled in closing with substantially linear flow rate change with poppet within orifice for minimized shock when the respective pilot stage is actuated to the valve closed position,

means coupling said inlet section of said raise second stage and said load means to said fluid source whereby the



normally open raise second stage unloads the fluid source during the normal rest state, a differential pressure compensated flow divider which is self piloted and coupled between said fluid source and both said load means and the inlet section of said raise second stage, said flow divider including a pilot chamber with a biasing means therein, said pilot chamber being in continuous restricted communication with said fluid source, said coupling means supplying a divided portion of said fluid source, said raise pilot stage having a pilot line directly coupled to said fluid source for full source pressure without coupling through a flow divider upstream of said flow divider for providing pilot pressure whereby upon solenoid actuation of said raise pilot stage to the valve closed state pilot pressure from said fluid source is immediately available to said raise pilot stage thereby to actuate said raise second stage and apply fluid to said load means with a substantially short dead time from actuation of raise pilot stage to initiation of raising of said load means.

4,276,811

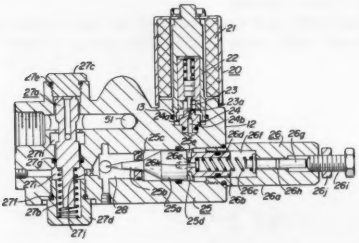
CLOSED CENTER PROGRAMMED VALVE SYSTEM WITH LOAD SENSE

Kenneth W. Zeuner, New Hope, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Continuation-in-part of Ser. No. 842,264, Oct. 14, 1977, Ser. No. 723,023, Sep. 13, 1976, Pat. No. 4,202,250, and Ser. No. 578,006, May 16, 1975, Pat. No. 3,980,002, said Ser. No. 578,006, is a continuation of Ser. No. 304,816, Nov. 8, 1972, abandoned, said Ser. No. 723,023, and Ser. No. 842,264, each is a continuation-in-part of Ser. No. 578,006,. This application Apr. 30, 1979, Ser. No. 34,778

Int. Cl.³ F15B *11/08, 11/20*

U.S. Cl. 91—449 **12 Claims**



1. A programmed valve system having a load sense fluid source with a load sense line for control of the positioning of load means by a pair of two stage valve assemblies comprising

a first of said two stage valve assemblies comprising a solenoid operated pilot stage maintained normally closed, a second stage divided into inlet and outlet sections with said inlet section being coupled to said fluid source, a second stage orifice between the sections within which a second stage poppet reciprocates,

a second of said two stage valve assemblies comprising a solenoid operated pilot stage maintained normally closed, a second stage divided into inlet and outlet sections, a second stage orifice between the sections within which a second stage poppet reciprocates,

said second stage poppets each having an outer substantially parabolic contour to provide a predetermined flow area between the respective orifice and parabolic contour, and

means coupling said load means to said outlet sections of said pair of valve assemblies, means free of a valve actuator for coupling said load sense line to said outlet section of said first valve assembly whereby a load sense signal is applied by way of said outlet section and said load sense line to said fluid source during the time said first assembly pilot stage is actuated to the valve open state.

4,276,812

POWER STEERING VALVE AND METHOD OF MAKING THE SAME

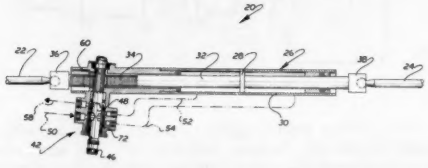
Richard W. Dymond, Rochester, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 27, 1978, Ser. No. 890,032

Int. Cl.³ F15B *13/04*

U.S. Cl. 91—467 **8 Claims**

1. A power steering apparatus comprising hydraulic motor means for assisting in operation of a vehicle steering gear, a housing having a plurality of passages connected in communication with a source of fluid and said hydraulic motor means, and valve means disposed in said housing for use in controlling fluid flow through said passages to thereby control operation of said hydraulic motor means, said valve means including an inner valve member and a one-piece cylindrical valve sleeve circumscribing said inner valve member, said valve sleeve including outer side surface means for defining an array of annular grooves each of which opens radially outwardly and extends around said sleeve, said array of annular grooves including a first annular groove connected in fluid communication with a first one of said passages in said housing, a second annular groove disposed to one axial side of said first annular groove and connected in fluid communication with a second one of said passages in said housing, said second annular groove having a radial depth which is greater than the radial depth of said first annular groove, said second annular groove having an annular bottom surface which slopes radially inwardly and axially in a direction away from said first annular groove so as to include a relatively large diameter surface portion and a relatively small diameter surface portion which small diameter portion is spaced further from said first annular groove than said relatively large diameter portion, and a third annular groove disposed to another axial side of said first groove opposite from said one axial side and connected in fluid communication with a third one of said passages in said housing, said third annular groove having a radial depth which is greater than the radial depth of said first annular groove, said valve sleeve further including inner surface means for defining a plurality of axially extending grooves on the inside of said valve sleeve and circumscribed by said array of annular grooves, each of said axially extending grooves having an axial length which is less than and within the axial extent of the array of annular grooves in the outside of said valve sleeve, at



least one of said plurality of axially extending grooves having a first sloping end surface which is disposed adjacent to said second annular groove and extends at an acute angle to the longitudinal central axis of said valve sleeve and a first constant depth main section which extends axially away from said first sloping end surface and is at least partially disposed radially inwardly of said first annular groove, said first sloping end surface of said one of said plurality of axially extending grooves sloping radially inwardly and axially outwardly in a direction away from said first annular groove from a portion having a relatively large cross sectional area which is disposed adjacent to said relatively large diameter portion of said bottom surface of said second annular groove to a portion having a relatively small cross sectional area which is disposed adjacent to said relatively small diameter portion of said bottom surface of said second annular groove, at least another one of said plurality of axially extending grooves having a second sloping end surface which is disposed adjacent to said third annular groove and extends at an acute angle to the longitudinal central axis of said valve sleeve and a second constant depth main section which extends axially away from said second sloping end surface and is at least partially disposed radially inwardly of said first annular groove and passage means for connecting each of said plurality of axially extending grooves in fluid communication with one of the grooves of said array of annular grooves.

4,276,813

PNEUMATIC CYLINDER ASSEMBLIES

Henry W. Weyman, Waterworks Rd., Worcester, England

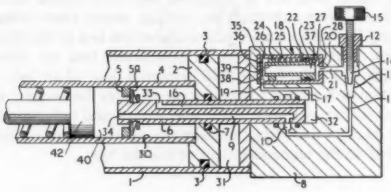
Filed Jun. 14, 1978, Ser. No. 915,515

Int. Cl.³ F15B *15/22*

U.S. Cl. 92—12 **3 Claims**

1. A system for controlling the ram speed of a pneumatic piston in a pneumatic piston and cylinder assembly comprising a hydraulic circuit which includes a hydraulic piston and

cylinder assembly and a fluid reservoir, said hydraulic piston being responsive to the operation of said pneumatic piston causing hydraulic fluid to be displaced from one side of said hydraulic piston to the other side via said hydraulic circuit, said circuit further including flow controlling means for controlling the rate of flow of hydraulic fluid to said reservoir whereby the ram speed of said pneumatic piston is controlled, said flow controlling means comprising a variable flow control orifice and a low pressure governer located upstream of said orifice, means for maintaining said fluid reservoir under constant pressure, said low pressure governer including a generally cylindrical chamber having an inlet and an outlet for hydraulic fluid and including a wall movable in response to an increase in hydraulic pressure on the outlet side of said chamber, said wall comprising a piston and associated piston rod having a free end and movable in said cylindrical chamber, said piston and piston rod having coaxial passageways formed therethrough, said free end of said piston rod forming one valve member of a valve which includes two cooperating valve members for controlling the flow of hydraulic fluid into said cylindrical chamber, and resilient means acting against said piston normally urging said free end away from said cooperating valve member.



4,276,814

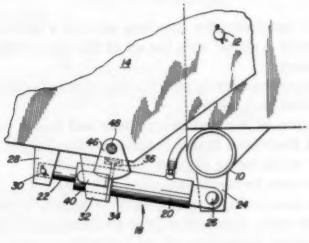
SAFETY LOCK FOR RAISING AND LOWERING MECHANISM

Merlyn D. Bass, and Donald W. Demorest, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 10, 1979, Ser. No. 56,386

Int. Cl.³ F15B *15/26*

U.S. Cl. 92—23 **6 Claims**



1. In a machine having a fixed part, a movable part carried by the fixed part for raising and lowering relative to the fixed part, and a fluid-operated unit for selective raising and lowering of the movable part and including a cylinder connected at one end to the fixed part and a piston rod extending from the other end of the cylinder and connected to the movable part, the improvement comprising a stop fixed to the movable part closely alongside the cylinder and so positioned as to move beyond the piston rod end of the cylinder when the movable part is raised, a blocking member having a pair of side walls defining a slot extending generally transverse to said cylinder, said slot having a first portion with a first dimension larger than the diameter of said piston rod and smaller than the outer diameter of said cylinder, a tranverse slide mounting the blocking member on the movable part adjacent to the stop, said blocking member selectively movable in said slide between a blocking position with the side walls interposed between the stop and piston rod end the cylinder and with said rod inserted through said first slot portion and an unblocking position with the side walls and the first slot portion clear of the said end of the cylinder and said rod, and means for selectively moving the blocking member between its two positions.

4,276,815

APPARATUS FOR OPENING, CONVEYING AND DIVIDING TUBULAR COVERINGS

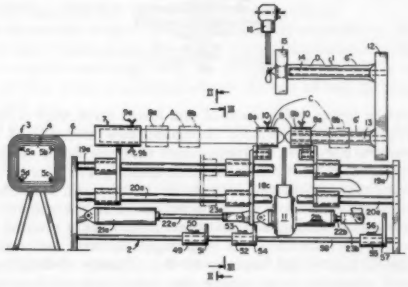
Gerhard Peter, Bomlitz, Fed. Rep. of Germany, assignor to Gerhard Peter KG, Bomlitz, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 904,104

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721392

Int. Cl.³ B31B *23/02*

U.S. Cl. 493—287 **11 Claims**



1. In an apparatus for opening conveying and dividing tubular coverings, the improvement comprising: means for continuously feeding a moist tubular covering, pneumatically operating tubular covering opening means, pneumatically operating tubular covering conveying means in synchronous operation with the opening means, and dividing and closing means spatially overlapping the conveying means and in synchronous operation therewith, the opening means, conveying means and closing and dividing means arranged consecutively on the tubular covering conveying run, and wherein the tubular covering conveying means comprises a tong like conveying gripper device movably mounted on both sides of the tubular covering in the tubular covering conveying direction for grasping and conveying the open tubular covering, which is free from filling, on its outer circumference on alternate sides.

4,276,816

WIND PROPELLED FAN

Bertha L. Tuley, 850 Maddox St., LaBelle, Fla. 33935

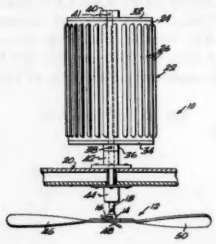
Filed Jan. 29, 1979, Ser. No. 7,050

Int. Cl.³ B60H *1/24*

U.S. Cl. 98—23 **1 Claim**

1. A wind propelled fan assembly for mounting through the roof of a building structure comprising, a multi-bladed fan structure disposed within an existing interior area of the structure and fixed to the lower end of a vertical drive shaft, said drive shaft being rotatably supported relative to the roof and with an extended portion upwardly outwardly a predetermined distance above the roof, a squirrel cage rotor, including a vertically extending drum with a plurality of parallel longitudinally extending circumferentially spaced apart vanes thereabout, upper and lower drum end closure plates with axially aligned center holes for through passage of said extended portion, means to fix said extended portion to said squirrel cage

rotor comprising a hub fixed to each of said upper and lower end closure plates with said drive shaft passing therethrough in a pinned relation therewith, said drive shaft being divided centrally of the squirrel cage into separate upper and lower axially aligned drive shaft portions, with said multi-bladed fan structure fixed to a bottom end of said lower portion, said means to fix comprising a hub fixed to said upper end closure plate with said upper drive shaft portion extending therethrough in a pinned relation therewith whereby said upper drive shaft portion and squirrel cage rotor rotate in unison under the influence of wind forces, speed control means to limit the rotational speed of the fan, including a ratchet, fixed



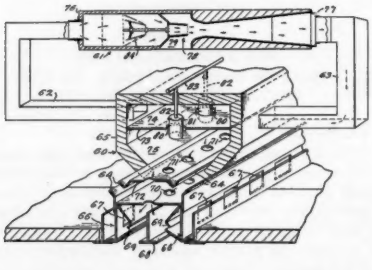
about an upper end portion of said lower drive shaft portion, vertically pivoted normally depending pawl means fixed to a lower end portion of said upper drive shaft portion in a manner whereby said pawl means depends under gravity forces into driving engagement with said ratchet to drive said lower drive shaft portion with said multi-bladed fan under the influence of normal wind forces, and said pawl means being pivoted upwardly and outwardly out of engagement with said ratchet means by centrifugal forces under the influence of abnormally severe wind forces to reduce the drive connection to said lower drive shaft portion and multi-bladed fan to limit the rotational speed of the fan.

4,276,817

AIR BAR ASSEMBLY

Gershon Meckler, 7425 Democracy Blvd. Unit 212, Bethesda, Md. 20034

Continuation of Ser. No. 959,634, Nov. 13, 1978, which is a continuation of Ser. No. 829,939, Sep. 1, 1977, which is a continuation of Ser. No. 741,092, Nov. 11, 1976, which is a continuation of Ser. No. 489,745, Jul. 18, 1974, which is a division of Ser. No. 308,180, Nov. 20, 1972, Pat. No. 3,828,180.
This application Aug. 1, 1979, Ser. No. 62,870
Int. Cl.³ F24F *13/04*
U.S. Cl. 98—38 E **3 Claims**



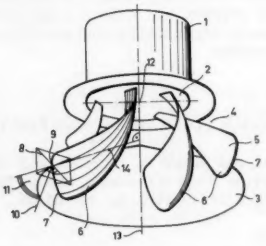
1. Air delivery apparatus comprising, in combination, an air bar assembly and an induction box, said air bar assembly comprising an air delivery section including an elongate channel having a web and opposed sidewalls, there being a plurality of longitudinally spaced openings in the web of said channel, means operatively associated with said channel and effective in combination therewith to form a duct having the web of said channel as one wall, the duct being essentially closed except for the openings in the web of said channel, a divider interior of and effective to divide the duct into a primary duct spaced from the web of said channel and a secondary duct adjacent the web of said channel, there being a plurality of openings in said divider through which air can flow between the primary and secondary duct, and valve means for controlling the flow of air through the openings in said divider, said induction box having means forming a passage for air flow from an inlet end to an outlet end, and at least one induction nozzle through which air flowing through the passage passes, there being an opening from the exterior of said induction box to the interior thereof, which opening is so positioned that air flowing through said induction nozzle induces a flow of air into said induction box, a duct for delivering air from the primary duct of said air bar assembly to the inlet end of said induction box, and a duct for delivering air from the outlet end of said induction box to the secondary duct of said air bar.

4,276,818

AIR DISTRIBUTOR

György Makara; Andras Morlin; Andras Fozo, and Robert Fülöp, all of Budapest, Hungary, assignors to Fütöber Épületgépészeti Termékeket Gyártó Vállalat, Budapest, Hungary

Filed Mar. 9, 1979, Ser. No. 19,096
Claims priority, application Hungary, Mar. 10, 1978, FU 359
Int. Cl.³ F24F *7/00*
U.S. Cl. 98—40 B **10 Claims**



1. An air distributor for injecting air into a space in which the injected air is mixed with the air of the space, said distributor comprising:

a cylindrical connecting pipe having an axially open circular air-discharge mouth;

a baffle plate of larger diameter than said mouth and axially spaced therefrom in the direction of flow of air from said mouth while being aligned therewith; and

a vane crown between said pipe ard said plate, said vane crown comprising a multiplicity of angularly equispaced curved vanes disposed at least predominantly outwardly of an axial projection of said mouth on said plate for imparting vortex movement to air emerging from said mouth and impinging on said plate.

4,276,819

ADSORBENT ENCLOSURE FOR AUTOMATIC TISSUE PROCESSORS

Max Goldman, Latham, and Arthur A. Stein, Albany, both of N.Y., assignors to Pathology Products, Ltd., Albany, N.Y.

Filed Apr. 29, 1980, Ser. No. 144,910
Int. Cl.³ F23J *11/00*
U.S. Cl. 98—115 LH **3 Claims**

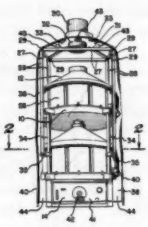
1. An apparatus for use with a tissue processing machine comprising of:

a rigid frame means formed of a plurality of substantially

vertically extending spaced apart members and a plurality of horizontal members, each vertical member secured to each adjacent vertical member by at least one horizontal member;

means for securing the tissue machine to said frame means so that the tissue processing means extends substantially into the volume defined by said frame means;

a transparent impermeable tent means secured to and surrounding said frame means, said tent means having a first



opening through which the tissue machine extends into said frame means and having a second opposed opening parallel to said first opening said tent means having a plurality of entrance panels through which access may be gained to the tissue machine; and

fume removal means attached to said frame means and communicating through said second tent means opening, said fume removal means evacuating the toxic fumes within said tent means, filtering said toxic fumes and releasing the filtered fumes to the atmosphere.

4,276,820

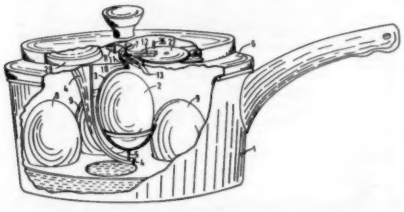
AUTOMATIC EGG COOKER

Constantinos J. Joannou, 2008 Dorval Ave., Ottawa, Ontario, Canada (K1G 2N8)

Filed Mar. 9, 1978, Ser. No. 884,995

Int. Cl.³ A47J *29/00*

U.S. Cl. 99—334 **8 Claims**



1. A device for cooking eggs comprising a pot, a lid and an egg holder in which an egg can be placed, torsion spring means being attached to said lid and said egg holder so as to suspend the egg holder from the lid so that said egg holder and said egg are free to oscillate; steam operated means to cause said egg holder to oscillate, a mechanism for measuring the total travel undergone by said egg holder and said egg any time said egg holder is made to oscillate, said mechanism being located on said lid; an alarm mechanism which is arranged to sound an alarm when said total travel undergone by said egg holder exceeds a pre-set amount of travel, said alarm mechanism also being located on said lid.

4,276,821

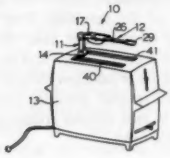
BUTTER MELTER DEVICE FOR TOASTER

John B. Brown, Rte. 2, Box 85, Colerain, N.C. 27924

Filed Jan. 7, 1980, Ser. No. 109,849

Int. Cl.³ A47J *37/08*

U.S. Cl. 99—339 **5 Claims**



1. An attachment for an electrically heated pop-up type toaster having a housing enclosing a toasting chamber and at least one opening in the top of the housing through which a bread slice or the like may be inserted into and removed from said toasing chamber, said attachment comprising:

(a) an upright support member detachably securable to said toaster housing and providing a support structure having a cantilevered arm with an upright member and a lip portion thereon elevated above the top of said housing: and

(b) a ladle adapted to be removably supported on said support structure above said housing opening and having a heat conductive receptacle portion for receiving and melting butter or the like therein, said receptacle portion having an opening adapted to be releasably fitted over said lip portion for holding said ladle during the melting of said butter or the like and integral therewith a handle portion such that when said ladle is mounted on said support structure above said toaster housing opening and said toaster is energized said butter or the like may be melted in said receptacle portion by utilizing heat rising from said housing opening.

4,276,822

APPARATUS FOR THE BATCH FILTERING OF SUSPENSIONS

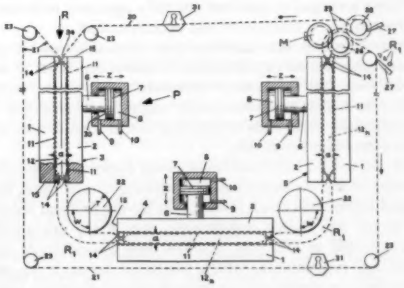
Wendel Bastgen, Betzdorf, Fed. Rep. of Germany, assignor to Alb. Klein & Co. GmbH KG, Niederfischbach, Fed. Rep. of Germany

Division of Ser. No. 902,039, May 2, 1978, Pat. No. 4,211,162. This application Nov. 9, 1979, Ser. No. 92,701

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720178

Int. Cl.³ B30B *15/30*

U.S. Cl. 100—207 **18 Claims**



1. Apparatus for discontinuously filtering suspensions, said apparatus comprising discrete, first and second pressure cham-

bers, means for advancing a suspension stepwise along a path of travel through said discrete separated first and second pressure chambers, means for applying external pressure to said suspension to effect filtering of the suspension by compression in said first pressure chamber to form a filter cake, the suspension being stationary in said first pressure chamber during said compression of said suspension, means for applying shearing forces to the surface of the resulting filter cake to alter its structure in the travel of said filter cake from the first filter chamber to the second filter chamber and means for applying external pressure to the filter cake to effect filtering of the cake by compression in said second pressure chamber, said filter cake being stationary in said second pressure chamber during said compression of said cake.

4,276,823

ECCENTRIC PRESS

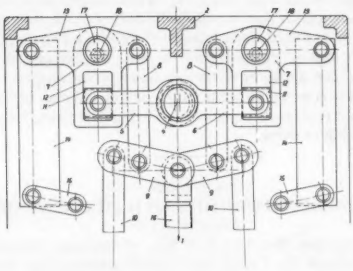
Frank Rotzler, Oetisheim, Fed. Rep. of Germany, assignor to R W M-Raster-Werkzeugmaschinen GmbH, Oetisheim, Fed. Rep. of Germany

Filed Dec. 27, 1979, Ser. No. 107,583

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1979, 2900900; Jan. 11, 1979, 2900901

Int. Cl.³ B30B *1/06*

U.S. Cl. 100—257 **15 Claims**



1. An eccentric press comprising

a frame,

an eccentric shaft rotatably mounted in said frame,

a ram vertically slidably mounted in said frame,

first and second connecting rod means, each of which has an inner end rotatably mounted on said eccentric shaft and an outer end, said first and second connecting rod means being arranged to perform mutually opposing motions in response to a rotation of said eccentric shaft,

first and second slot-defining means carried by said frame and disposed on opposite sides of said eccentric shaft and defining first and second horizontal guide slots, respectively, which are horizontally aligned and arranged to guide said outer ends of said first and second connecting rod means, respectively,

first and second ball crank lever means disposed on opposite sides of said eccentric shaft and pivoted to said frame, first and second bell crank lever means having first and second output arm means, respectively, which are operatively connected to said ram, and first and second guide arm means, respectively, which extend at an angle to said output arm means and are formed with substantially vertical first and second guide slot means, respectively, which are arranged to guide said outer ends of said first and second connecting rod means, respectively.

4,276,824

DRIVING AND BRAKING SYSTEM FOR AN ELECTRONIC EMBOSSING MACHINE

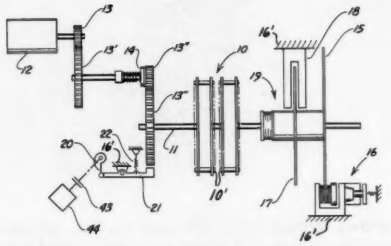
Helmut A. M. Schöttle, Berlin, Fed. Rep. of Germany, assignor to Pitney Bowes Deutschland GmbH, Heppenheim, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 22,014

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1978, 2812333

Int. Cl.³ B41J *1/44*

U.S. Cl. 101—18 **9 Claims**



1. Driving and braking apparatus for an electronic embossing machine, comprising: a housing, a shaft rotatably disposed within said housing, a die drum having a plurality of embossing dies mounted on said shaft, a drive motor, means for drivingly engaging said motor and said shaft, a control disk having location sensing means at the perimeter thereof mounted on said shaft, a sensor located to receive a portion of said control disk and a brake means for braking the die drum including an elastic coupling mounted on said shaft, a brake disk supported by said elastic coupling, and an electric clutch supported by said housing, said brake disk being brakingly engageable by said electric clutch.

4,276,825

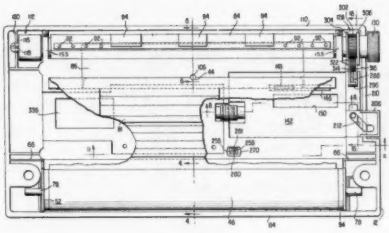
PORTABLE TRANSACTION LOG RECORDER

Morton W. Thomson, South Easton, Mass., assignor to DBS, Inc., Randolph, Mass.

Filed Jan. 29, 1979, Ser. No. 7,637

Int. Cl.³ B41F *3/04*

U.S. Cl. 101—45 **20 Claims**



1. A portable transaction log recorder for processing therein at least one transaction log sheet having a plurality of transaction data entry blocks disposed along the length thereof and a plurality of registration holes respectively associated with said data entry blocks, said recorder comprising

a base;

means supported by said base for removably receiving a printing plate;

supply means disposed on one side of said printing plate receiving means supported by said base for removably storing said transaction log sheet;

take-up means disposed on the other side of said printing

plate receiving means supported by said base for advancing said transaction log sheet from said supply means across said printing plate receiving means;

a sensing pin;

first biasing means for biasing said sensing pin toward said transaction log sheet so that said pin extends through one of said registration holes when said one hole and said pin are aligned;

said sensing pin being so located with respect to said printing plate receiving means that when said pin extends through said one registration hole, an associated one of said transaction data entry blocks is aligned with said printing plate receiving means;

means for moving said sensing pin out of the path of travel of said transaction log sheet prior to advancement of the next data entry block following said one data entry block to the printing plate receivig means so that said log sheet may be advanced by said take-up means until said sensing pin is urged through the next registration hole following said one registration hole under the influence of said first biasing means; and

second biasing means for biasing said sensing pin in a second direction which is so angled with respect to the biasing direction of said first biasing means that, as said next hole is advanced to said sensing pin, the sensing pin is moved away from a first point on the periphery of said next hole as soon as said pin contacts said first point thereby lessening the tendency for said registration holes to be damaged as the sensing pin is urged therethrough.

4,276,826

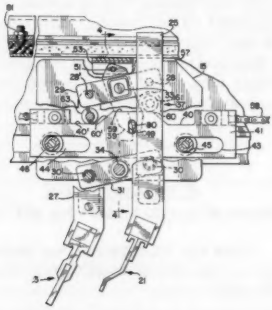
SQUEEGEE AND FLOOD BAR ACTUATOR

Henry J. Bubley, Deerfield, and Claude H. Oltra, Chicago, both of Ill., assignors to American Screen Printing Equipment Company, Chicago, Ill.

Filed Feb. 6, 1980, Ser. No. 118,920

Int. Cl.³ B41F *15/36*

U.S. Cl. 101—123 **9 Claims**



4. In a screen printing press including a frame, a printing bed supported on said frame to receive work to be printed, a press head pivotally mounted to said frame for angular movement relative to said printing bed, a carriage mounted to said press head for reciprocation therealong relative to said printing bed, a screen removably mounted to said carriage in a position above said work on said printing bed, a squeegee and flood bar mounted to said carriage and being movable therewith, drive means associated with said carriage and being operable to reverse direction for moving said squeegee across said screen in a first direction for the print stroke, and for moving said flood bar across said screen in the reverse direction for the flood stroke, the improvement comprising:

a fixed surface mounted to said press head above said carriage;

a chassis movably mounted to said carriage, said chassis having an upper surface;

a parallelogram support pivotally mounted to said carriage, said squeegee being mounted to one end of said parallelogram support and being pivotal therewith relative to said screen, said flood bar being mounted to the other end of said parallelogram support and being pivotal therewith relative to said screen;

first and second roller means, said first roller means being mounted to one end of said parallelogram support and being movable along said upper surface for raising and lowering said squeegee relative to said screen, said second roller means being mounted to the other end of said parallelogram support and being movable along said upper surface for raising and lowering said flood bar, said first and second roller means cooperating to simultaneously raise said squeegee while lowering said flood bar, and to lower said squeegee while raising said flood bar; and,

actuator means pivotally mounted to said carriage and attaching at one end of said chassis, said actuator means having an engaging means at the other end lightly contacting said fixed surface during said print and flood strokes, said engaging means firmly contacting said fixed surface in response to a change in direction of movement of said carriage to secure said carriage from movement as said first and second rollers raise and lower said squeegee and flood bar relative to said screen for said print and flood strokes.

4,276,827

OPERATOR SAFETY DEVICE

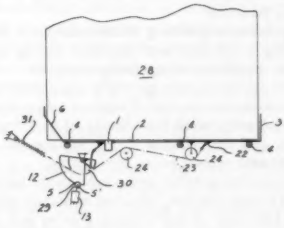
Hans Johne, Radebeul; Arndt Jentzsch, Coswig; Lothar Schmidt, Radebeul; Wolfgang Müller, and Mandred Funke, both of Coswig, all of German Democratic Rep., assignors to Veb Polygraph Leipzig Kombinat für Polygraphische Maschinen und Ausrüstungen, Leipzig, German Democratic Rep.

Filed Mar. 5, 1979, Ser. No. 17,139

Claims priority, application German Democratic Rep., Mar. 16, 1978, 204213

Int. Cl.³ B41F *5/00*

U.S. Cl. 101—212 **7 Claims**



1. An operator safety device for a printing press having at least two parts defining a footpath therebetween, comprising a supporting traverse arranged across said footpath, a double cover including a main cover and a first side cover, said main cover being hinged at one side thereof to said traverse and at the opposite side to said first side cover, a second side cover hinged to said traverse opposite said main cover, said covers being rotatable between a first position in which they cover said parts and a second position in which said parts are exposed, a rotatable switching cam arranged under said covers and defining a recess in its periphery, a switch having a movable control rod springbiassed against said switching cam, said switch being in its closed state when said rod engages said recess and in its open state when said rod disengages said recess, linking means coupled between each of said covers and said switching cam to rotate the same into a position in which said control rod engages said recess when all covers are in said

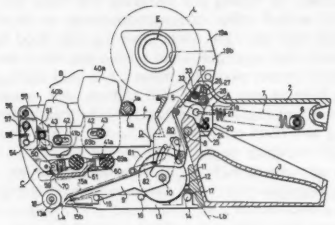
first position and to disengage said rod from said recess when at least one of said covers is moved from said first into said second position.

4,276,828

CONSTANT PRESSURE ASSEMBLY FOR HAND OPERATED LABEL PRINTING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Filed Apr. 19, 1979, Ser. No. 31,639
Claims priority, application Japan, Apr. 24, 1978, 53/47804
Int. Cl.³ B41J *5/00*
U.S. Cl. 101—291 **2 Claims**



1. A label printing machine, comprising:

a machine frame;

an operating lever, for being operated to move with respect to the machine frame; a printing lever integrally connected with said operating lever such that said operating lever and said printing lever move together from a rest position toward a printing position; a first pivot connection between said operating and printing lever, on the one hand, and said machine frame, on the other hand, and being located intermediate the length of said operating and printing lever; a printing device, including printing types, carried on said printing lever;

a platen connected to said machine frame and positioned in opposition to said types as said printing lever moves to said printing position, whereby said types will engage a label on said platen when said printing lever is in said printing position;

printing pressure regulating means interposed between said operating lever and said machine frame, said printing pressure regulating means comprising:

a pressure applying cam pivotally supported at a second pivot connection on one of said operating lever and said machine frame and in the vicinity of said first pivot connection; said cam having a cam surface thereon spaced from the said second pivot connection;

a pressure receiving roller and a support for said roller, said support being pivotally attached at a third pivot connection to the other of said operating lever and said frame;

respective means for positioning said roller support and said cam such that said cam surface will abut said roller as said operating lever moves toward said printing position and before said type engage said platen, said third pivot connection being spaced from the location on said roller to be abutted by said cam surface, whereby pivoting of said support moves said abuttable location of said roller on an arcuate pathway;

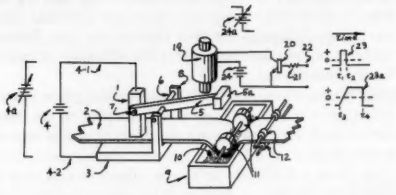
first biasing means for urging said cam to pivot to a position for blocking bypassage of said cam surface and said roller; second biasing means for urging said roller support to move said roller location to a position for blocking bypassage of said cam surface and said roller; said first and said second biasing means being of such relative strengths that when said cam surface has been moved into abutment with said roller and when a predetermined pressure is applied on said operating lever, at least one of said cam and said roller support resiliently deflects and pivots to permit said cam surface to bypass said roller, so that said types are then freed to abut a label on said platen due to force being applied to said operating lever to move said printing lever to said printing position.

4,276,829

MECHANO-ELECTROSTATIC CHARGE-IMAGING METHOD AND APPARATUS

Wu Chen, 26 W. Ridge Pike, Royersford, Pa. 19468

Continuation-in-part of Ser. No. 873,900, Jan. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 683,429, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 469,522, May 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 311,532, Dec. 4, 1972, abandoned. This application Sep. 20, 1979, Ser. No. 77,285
Int. Cl.³ G03G *15/22*
U.S. Cl. 101—426 **24 Claims**



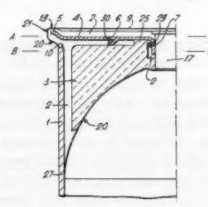
1. The method of operating a charge-imaging system in its mechano-electrostatic imaging domain for forming charge-image on a charge-retaining imaging object with an imaging means capable of transmitting a mechanical image-activating energy and an electrical image-activating energy, and which comprises: positioning said imaging means and said imaging object in operative relationship; applying said mechanical image-activating energy in pre-set magnitude to said imaging object via said imaging means; applying said electrical image-activating energy, in magnitude within the range of operation of the mechano-electrostatic imaging domain of said system, to said imaging object via said imaging means; and controlling the timing of at least one of the said applications of the mechanical and of the electrical image-activating energies so that there is an overlapping time period during which both said image-activating energies act on a shared location of the said imaging object.

4,276,830

CARTRIDGE CASE

Julio C. Pastora Alice, c/3.-Av. 4-6 - No. 429, San Jose, Costa Rica

Filed Apr. 12, 1979, Ser. No. 29,509
Int. Cl.³ F42B *5/26, 7/06*
U.S. Cl. 102—467 **2 Claims**



1. An improved cartridge case comprising an external plastic tube, a metallic member located adjacent one end of said external plastic tube, an inner plastic welding mass extending within said external plastic tube adjacent one end thereof and over and beyond said one end, said metallic member including a

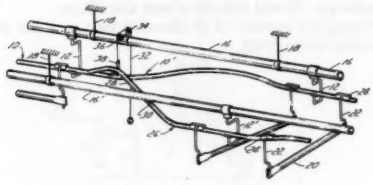
generally flat portion with an elevated conical peripheral portion forming a blunt angle with said flat portion, said conical portion extending to a circular surface and a sharp edge, said inner plastic welding mass fully enclosing said metallic member to provide an extraction collar reinforced by said metallic member fully enclosed therein.

4,276,831

TROLLEY STORAGE

Jean-Paul Leger, 5000-4e rue, Chomedey, Laval, Quebec, Canada

Filed Jan. 2, 1979, Ser. No. 9
Claims priority, application Canada, Jan. 6, 1978, 294510
Int. Cl.³ E01B *25/22*
U.S. Cl. 104—93 **3 Claims**



1. A trolley storage system for storing a plurality of individual trolleys, each trolley having a leading wheel assembly and a trailing wheel assembly; the system comprising: a main generally horizontal rail having an upstream portion and a storage portion; a secondary generally horizontal storage rail spaced from the storage portion of the main rail and forming a storage area with the storage portion of the main rail for trolleys; a switching rail at the entrance to the storage area and movable between a first closed position where it connects the upstream portion of the main rail to the secondary rail and a second open position where it disconnects the upstream portion of the main rail from the secondary rail; means for moving the switching rail between its first and second position; said switching rail moving means including operator means located in the storage area and positioned to be actuated by the leading end of a leading trolley in the storage area before the trailing end of the same trolley reaches the entrance of the storage area, the operator means controlling the moving means to automatically allow the trailing wheel assembly of the leading trolley, and the leading wheel assembly of an adjacent trailing trolley, to enter the storage area on the other rail from the rail in the storage area already carrying the leading wheel assembly of the leading trolley.

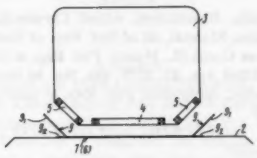
4,276,832

TRANSPORTATION DEVICE WITH AN ELECTRODYNAMIC SUSPENSION

Zigurd K. Sika, ulitsa A. Eremenko, 9, kv. 40; Voldemar V. Apsit, ulitsa Lenina, 66, kv. 22; Khubert L. Daugulis, ulitsa Blaumanya, 12-a, kv. 5, and Ivan I. Kurkalov, ulitsa Tilta, 11/5, kv. 14, all of Riga, U.S.S.R.

Filed Dec. 12, 1978, Ser. No. 968,869
Claims priority, application U.S.S.R.,
Int. Cl.³ B61B *13/08*
U.S. Cl. 104—292 **13 Claims**

1. A transportation device with an electrodynamic suspension, comprising a vehicle adapted for moving along a track bed having a track axis, field coils of a motor, field coils of a suspension, and field coils of transverse stabilization, said coils being each mounted on said vehicle, and a three-phase winding mounted horizontally along said track bed and including active portions of turns formed as plates having a width of up to one-third of the pole pitch of said three-phase winding, and end portions comprising rectangular plates formed in two layers and arranged in parallel with the track axis, at least one layer of said end portions being mounted parallel to said field coils of transverse stabilization, said three-phase winding and said field



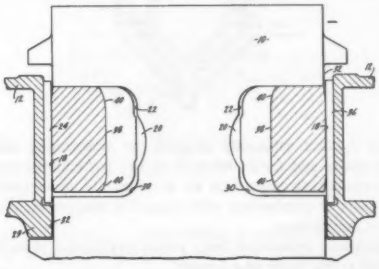
coils of said motor forming a linear synchronous motor, and said end portions being used as reactive buses for transverse stabilization of said transportation device.

4,276,833

RAILWAY TRUCK FRICTION STABILIZING ASSEMBLY

Robert L. Bullock, Lombard, Ill., assignor to Standard Car Truck Company, Chicago, Ill.

Filed Nov. 8, 1978, Ser. No. 958,790
Int. Cl.³ B61F *5/06, 5/12, 5/50*
U.S. Cl. 105—197 DB **5 Claims**



1. A friction member for use in the bolster pocket of a stabilized railroad car truck having a bolster positioned within a side frame window, said friction member having a slanted friction surface adapted to bear against a slanted wear surface within the bolster pocket and a vertical friction surface adapted to bear against a side frame wear surface, said slanted friction surface having a profile in a generally horizontal plane through the bolster consisting of a central flat portion and adjoining outside arcuate portions, said flat portion having a width equal to twice the distance between the side frame center line and the point of rotation of the side frame relative to the bolster means positioning said point of rotation such that, during side frame rotation, the distance from the side frame center line to the point of intersection of the plane of said vertical friction surface and the plane of the side frame wear surface is no greater than one half of said friction member horizontal thickness.

5. A friction member for use in the bolster pocket of a stabilized railroad car truck having a bolster positioned within a side frame window, said friction member having a slanted friction surface adapted to bear against a slanted wear surface within the bolster pocket and a vertical friction surface adapted to bear against a side frame wear surface, said slanted friction surface having a profile in a generally horizontal plane through the bolster consisting of a central flat portion and adjoining outside arcuate portions, said arcuate portions having a radius such that, during rotation of the side frame relative to the bolster, there is contact between the side frame and bolster before the friction member arcuate portion contacts an interior corner of the bolster pocket.

4,276,834

FURNACE FOR INCINERATION OF NUCLEAR FISSION AND FERTILE MATERIAL WASTE PARTICULARLY PLUTONIUM AND URANIUM CONTAINING ORGANIC WASTE

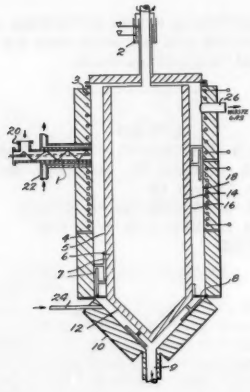
Eduard Bregulla, Bruchkobel; Alfred Chrubasik, Neuss, and Horst Vietzke, Maintal, all of Fed. Rep. of Germany, assignors to Nukem G.m.b.H., Hanau, Fed. Rep. of Germany

Filed Apr. 27, 1979, Ser. No. 34,184

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819059

Int. Cl.³ F23G *7/00*; G21F *9/32*

U.S. Cl. 110—237 **8 Claims**



1. A furnace especially adapted for incinerating nuclear fission waste and fertile material waste, particularly organic waste containing plutonium or uranium, by pyrohydrolysis with steam or combustion with oxygen in safe geometry, said furnace comprising:

a stationary cylindrical outer jacket terminating at its lower end in the shape of a funnel:

a rotatable inner cylinder coaxially disposed within said jacket and also terminating at its lower end in the shape of a funnel to define, with said jacket, an annular gap therebetween, the wall of said inner cylinder being provided with material especially adapted to absorb neutrons, the diameter of said inner cylinder being so regulable that said annular gap guarantees a safe layer thickness; and

scrapers for the outer surface of said cylinder and the inner surface of said jacket secured respectively to the inner side of said jacket and the outer side of said cylinder.

4,276,835

METHOD FOR PROCESSING SEWAGE SLUDGE

Erich Zeltner, Gockhausen, Switzerland, assignor to Von ROLL AG, Gerlafingen, Switzerland

Filed Oct. 4, 1979, Ser. No. 81,683

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—342 **9 Claims**

1. A method of self-energized drying of sewage sludge while leaving essentially dust-free and odor-free effluent from an apparatus having

a combustion chamber (**60**, **60*a***) having a solid particle or powder burner (**90**);

a mixing or pulverizing-type dryer (**1**) receiving the sludge, in which the sludge is dried;

a solid-particle separator (**2**) for removing solid particles upon drying of the sludge;

a blower (**4**) generating an air stream;

a heat exchanger (**5**);

said combustion chamber, dryer, solid-particle separator, blower, and heat exchanger being connected in a closed loop circuit;

and a controlled bypass connection (**P2**) between the downstream side of the heat exchanger (**5**) and the dryer, bypassing the combustion chamber,

said method comprising the steps of

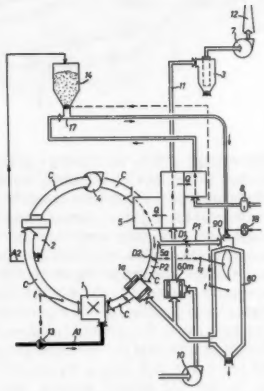
generating, by means of the blower (**4**), a stream of air in the closed circuit;

introducing sludge material into the dryer (**1**) where the sludge is dried and at least partly converted into volatile combustible dust components and gaseous components to form a gas;

removing solid dust particles from the mixture of the air in the air stream and volatile combustible components from the dried sludge in the separator (**2**) to obtain a powder of combustible dust;

passing the remaining gas of the stream through the heat exchanger (**5**) and removing heat therefrom;

conveying the powder of combustible dust as a fuel to the powder burner (**90**);



introducing a portion (**P1**) of the gas received from the heat exchanger to the combustion chamber (**60**, **60*a***) to provide combustion air thereto;

circulating the remaining portion (**P2**) of the gas received from the heat exchanger (**5**) to the dryer (**1**);

removing from the combustion chamber (**60**, **60*a***)

(a) ash and non-combustible residue after burning of the combustible dust by the burner in the presence of the first portion (**P1**) of gas from the heat exchanger and

(b) hot combustion gases;

re-introducing a portion of said hot combustion gases from the combustion chamber to the dryer (**1**);

mixing the hot combustion gases received from the combustion chamber with the gas received from the heat exchanger to provide to the dryer and the sludge introduced thereto drying air at a temperature which is below the temperature of the combustion chamber and which has an oxygen content insufficient for spontaneous combustion of the sludge introduced into the dryer;

and filtering the remaining portion of hot gases removed from the combustion chamber and then venting them to the atmosphere.

4,276,836

GRAIN DRILL UTILIZING A FERTILIZER SPOUT AND ADJUSTABLE DEFLECTOR THEREFOR

Waldo H. Pust, Savage, Mont. 59262

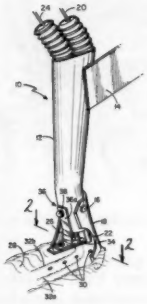
Filed Oct. 31, 1979, Ser. No. 89,900

Int. Cl.³ A01C *5/08*

U.S. Cl. 111—86 **4 Claims**

1. In a grain drill, a downwardly extending boot, said boot

having a forward portion, a furrow opener mounted on the forward portion of said boot, a first spout having an opening at a first predetermined level extending downwardly through said boot for depositing seed into a furrow as the grain drill traverses a field to be planted, a second spout having an opening at a second predetermined level extending downwardly through said boot in rearward spaced alignment with said seed spout for depositing fertilizer into said furrow in a trailing



relation with respect to said first spout, said second predetermined level being above said first predetermined level, a deflector plate disposed in a generally horizontal plane between said first and second predetermined levels and extending laterally to each side thereof, and means for adjusting said deflector plate forwardly into contact with said seed spout and rearwardly in said generally horizontal plane out of contact with said seed spout.

4,276,837

WELT FEEDER FOR SEWING MACHINES

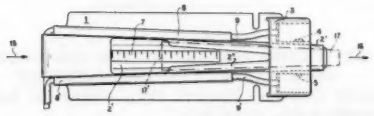
Kurt Biermann, and Kurt Reinke, both of Bielefeld, Fed. Rep. of Germany, assignors to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,770

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 7902807[U]

Int. Cl.³ D05B *35/06, 69/20*

U.S. Cl. 112—152 **4 Claims**



1. At a sewing machine having a reciprocating sewing-needle drive and a stitch counter for arresting same upon reaching a predetermined count, the combination therewith of a device for feeding a workpiece to a sewing station, said device comprising:

guide means for guiding said workpiece along a feed path extending to said station;

marker means on said guide means for implementing the manual positioning of said workpiece prior to the feeding thereof to said station;

a photocell on said guide means connected to said counter for activating same upon detecting the passage of a back edge of said workpiece during feeding thereof to said station; and

a light source disposed on said guide means across said path from said photocell for emitting thereto a light beam extending substantially transversely to said path, whereby a beam interrupted by said workpiece is reinstated upon passage thereof to energize said photocell.

4,276,838

THREAD CHANGER FOR EMBROIDERING MACHINES

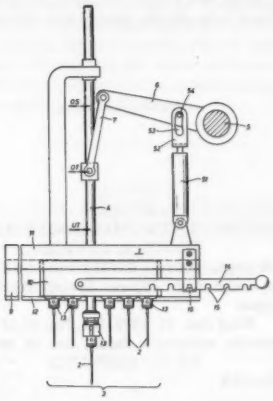
Kurt Bolldorf, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,799

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927142

Int. Cl.³ D05B *55/16;* **D05C** *11/06*

U.S. Cl. 112—221 **13 Claims**



1. In a machine for embroidering a workpiece of the type having a needle magazine, a plurality of needles movably mounted to the needle magazine to define a needle group, each needle of the needle group equipped with a different thread, and means for selectively imparting axial reciprocatory movement to needles of the needle group to perform a thread change, the improvement wherein the reciprocating means comprises a single elongated needle bar associated with the group, and further comprising means for moving the needle magazine relative to said needle bar to selectively align each needle with said needle bar, means for disengageably coupling a selected needle of the needle group to said needle bar, and means for detachably locking each of the needles to the needle magazine.

4,276,839

NEEDLE BAR PENDULUM FOR SEWING MACHINES

Willi Meier, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dorina Nahmaschinen GmbH, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,161

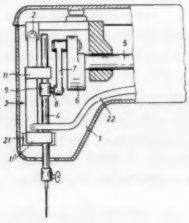
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 2829497

Int. Cl.³ D05B *55/06*

U.S. Cl. 112—227 **3 Claims**

1. A needle bar pendulum for sewing machines, comprising a carrier bar having a bearing engagement end at each end, first and second separate bearing members each having a carrier bar bore therethrough through which respective engagement ends of said carrier bar engage and are connected by adhesive, each

of said first and second bearing members having a needle bar bore therethrough for the passage of a needle bar, each of said



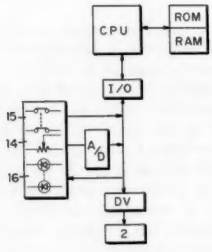
needle bar bores and carrier bar bores of each said bearing members being substantially parallel to each other.

4,276,840

ELECTRONIC SEWING MACHINE WITH A FEED CONTROL DEVICE

Hideaki Takenoya, Hachioji, and Hachiro Makabe, Fussa, both of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1979, Ser. No. 47,631
Claims priority, application Japan, Jun. 14, 1978, 53-70772
Int. Cl.³ D05B *27/22*
U.S. Cl. 112—315 **3 Claims**



1. In a sewing machine which utilizes a pulse motor to control feed rates of cloth sewed thereby and in which such feed rates can only be discontinuously varied between available feed rates that are spaced apart adjacent each other, an improvement allowing a user of the machine to operate the machine at a desired overall feed rate intermediate available feed rates, comprising:

a user-variable means for selecting the overall feed rate desired; and

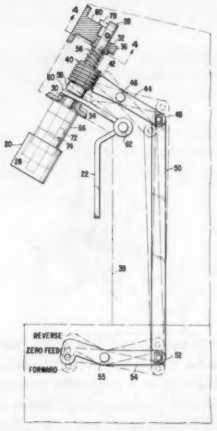
a computer cooperating with the means and the pulse motor, the computer operating in a manner that when the means is adjusted to an overall rate corresponding to an available feed rate the computer causes the pulse motor to operate at said available feed rate, and when the means is adjusted to an overall rate corresponding to a rate intermediate two adjacent available feed rates the computer causes the pulse motor to operate in a repeated sequence, in which sequence the pulse motor is first operated at a one of said adjacent available feed rates and is subsequently operated at another of said adjacent available feed rates.

4,276,841

STITCH LENGTH AND FEED REVERSING CONTROL FOR A SEWING MACHINE

William Weisz, Tenafly, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 24, 1979, Ser. No. 78,335
Int. Cl.³ D05D *27/00*
U.S. Cl. 112—317 **8 Claims**



1. In a sewing machine, stitch length regulating and feed reversing control means including a rotatably and axially movable shaft having a worm gear affixed thereon; a pivotally mounted member having a gear segment thereon in engagement with the worm gear; a manually operable control movable in one direction for imparting axial movement to said shaft effective to cause the worm gear to move the gear segment and member, and movable in another direction for imparting rotational movement to the shaft effective to cause the worm gear to move the said gear segment and member; and linkage means operably connected to said member and positionable thereby for conditioning the operation of feed regulating mechanism for reverse feed in response to axial movement of the shaft, and for controlling the operation of the feed regulating mechanism in forward feed in response to rotational movement of the shaft.

4,276,842

DEVICE FOR REGULATING THE TRANSPORT MECHANISM IN SEWING MACHINES

Giancarlo D. Torre, Biassono, Italy, assignor to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Nov. 16, 1979, Ser. No. 95,181
Claims priority, application Italy, Jan. 5, 1979, 19061 A/79
Int. Cl.³ D05B *27/12*
U.S. Cl. 112—322 **4 Claims**

1. A regulating device for the workpiece transport mechanism in sewing machines having a needle and presserfoot disposed in the machine's sewing zone and of the type for joining a plurality of layers of material forming the workpiece, said regulating device comprising:

(a) a tubular support (**14**) pivotably attached to the sewing machine;

(b) a rotatably driven shaft (**13**) mounted in and extending from said tubular support including:

(i) a wheel member (**12**) fixed on the end of said driven shaft (**13**) extending from said tubular support (**14**);

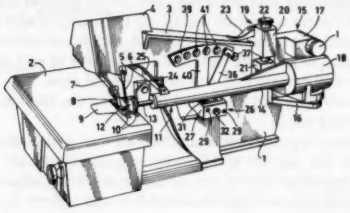
(c) biasing means (**19**) operatively connected to said tubular support (**14**) for urging the latter in a direction to effect engagement of said wheel member (**12**) with the upper layer of the workpiece; and

(d) regulating means (**26**) operatively associated with said tubular support (**14**) including:

(i) a body portion (**27**) forming a support structure attached to the machine;

(ii) a limiting member (**31**) defining an eccentric roller mounted for rotative movement within said body portion (**27**) in operative engagement with said tubular support (**14**); and

(iii) means for rotating said limiting member (**31**) to any one of a plurality of fixed positions for selectively changing the operating position of said wheel member (**12**) to accommodate workpieces of different thicknesses.



4,276,843

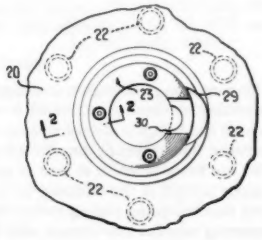
DOME TOOLING TO ELIMINATE TAB PROTRUSION OF A CAN END

Everett T. Hansen, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,816

Int. Cl.³ B21D *51/38*

U.S. Cl. 113—1 F **7 Claims**



1. A method of doming an end panel of a metal easy opening end unit having a removable panel portion defined by a peripheral line of weakness to remove inherently loose metal from the end panel, said method comprising the steps of clamping an outer portion of an end panel including said peripheral line of weakness on an annular support, and while holding said end panel including said peripheral line of weakness on the annular support, engaging a central part only of said end panel and axially displacing said end panel within said support to stretch the metal of said end panel to remove said loose metal from said end panel and to effect a minor doming of said end panel radially inwardly of said peripheral line of weakness.

4,276,844

SOFT SAILBOARD

Michael J. Fremont, Encinitas, Calif., assignor to Kransco Manufacturing, Inc., South San Francisco, Calif.

Filed Jun. 18, 1979, Ser. No. 49,094

Int. Cl.³ B63B *35/00*; **B63H** *9/00*

U.S. Cl. 114—39 **4 Claims**

1. A soft sailboard comprising an elongated soft foam slab, elongated longitudinally extending generally rigid support means embedded in said slab adjacent the longitudinal midline thereof, said support means comprising a pair of spaced parallel stringers extending for substantially the full length of said slab, said stringers having opposed planar surfaces, and a box-like mast mount insert disposed between and connected to said opposed planar surfaces of said stringers.

4,276,845

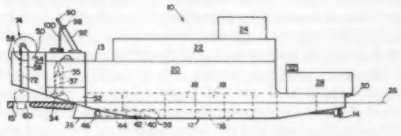
ICE CUTTING AND BREAKING VESSEL

W. F. Spanner, 4 Albion Ter., The Common, Patchway, Bristol BS12 6AN, England

Filed Aug. 17, 1979, Ser. No. 67,452

Int. Cl.³ B63B *35/08*

U.S. Cl. 114—42 **6 Claims**



1. An icebreaker vessel including a hull for clearing a channel through an ice layer comprising:

a rectangular forefront, extending out over the ice layer, which is wider than the hull;

a plurality of elongate hollow guides attached to said forefront and extending in a vertical direction, said guides being located above the water line;

a corresponding plurality of cutting blades, each of said blades disposed respectively in one of said guides;

means for lowering said blades into the ice layer and raising said blades back into said corresponding guides;

a bow portion extending downward and aft in a generally planar configuration from said forefront to the hull, said bow portion being substantially rectangular in vertical cross section;

a prow, depending from said bow portion and forming a wedge-shaped keel, said prow widening gradually to merge with said bow portion;

means, including orifices located on the port and starboard sides of said prow, for discharging water laterally along the bottom of said bow portion; and

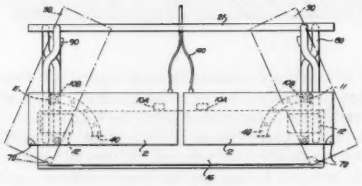
an emergency water ballast tank, located above the water line at the aft end of the vessel, which is quickly emptied through large ports;

such that as the icebreaker travels through an ice layer, said cutting blades break the ice layer into pieces which slide below said bow portion and are then pushed under the surrounding ice layer by said prow and said water discharging means.

4,276,846
RECOVERY APPARATUS

Douglas E. Anderson, "Little Timbers", Horley Row, Horley, Surrey RH6 8DH, England

Continuation of Ser. No. 850,047, Nov. 9, 1977, abandoned. This application Oct. 5, 1979, Ser. No. 82,153
Claims priority, application United Kingdom, Oct. 27, 1973, 50119/73; Nov. 26, 1973, 54704/73; Jun. 3, 1974, 24576/74
Int. Cl.³ B63C *7/08*
U.S. Cl. 114—52 11 Claims

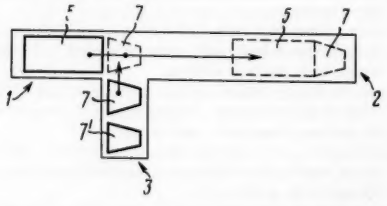


1. In an apparatus for use in recovering an at least partially submerged article or material such as an article stranded in water, at least two floatable members each having a longitudinal axis and whose buoyancy can be varied and each of said members having an arm connected to an end portion thereof, each of said arms carrying a recovery member selected from gripping and scooping means and being connected by means of a pivot to the remainder of said arms, said arms being so shaped and arranged as to oppose two or more of said respective recovery members such that a portion of said apparatus in the region of the pivot is adapted to move downwardly under the influence of gravity thereby causing said opposed recovery members to tend to come together in a caliper-like action, the improvement comprising providing for each of at least two of said floatable members a pivotal connection to one of said arms such that said at least two of said floatable members are pivotable floatable members which are pivotable in an upward direction about said pivotal connections in a substantially vertical plane to a maximum elevation when the angle between said longitudinal axis and the horizontal in said vertical plane is less than 90° said pivotable floatable members being so arranged about said apparatus as to stabilise said apparatus when they are elevated against rolling thereof, a floatable member locking means being provided to hold each of said pivotable floatable members at least in the horizontal and said maximum elevated positions.

4,276,847
METHOD FOR ASSEMBLING HULLS OF VESSELS

Jury P. Ivanov, Grazhdansky prospekt, 92/2, kv. 1, Leningrad, U.S.S.R.

Filed Jun. 27, 1978, Ser. No. 919,510
Int. Cl.³ B63B *3/00, 5/00, 9/06*
U.S. Cl. 114—65 R 18 Claims



1. A method for assembling hulls of vessels intended to carry bulk, liquid and gas cargo and comprising an aft end, a parallel middlebody and a fore end, the method being carried out on a building berth comprising a main site composed of a rear area and a front area and including at least one adjacent transverse lateral area, said method comprising:

assembling a first part of said parallel middlebody, adjacent to said aft end, in the rear area of said main site;

assembling said aft end in said lateral area;

transferring said assembled aft end to the front area of said main site;

transferring said assembled part of the parallel middlebody adjacent to said aft end to the front area of said main site;

assembling a second part of said parallel middlebody, adjacent to said fore end, in the front area of said main site;

assembling said fore end in said lateral area;

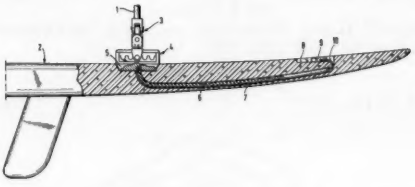
transferring said assembled fore end to the front area of said main site;

joining together said assembled aft end, said assembled part of the parallel middlebody adjacent to the aft end, said assembled part of the parallel middlebody adjacent to the fore end, and said assembled fore end to form a completed hull; and launching the completed hull.

4,276,848
DEVICE FOR CONNECTING A SAILMAST TO A SAILBOARD

Hannes Marker, Hauptstrasse 51-53, 81 Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 961,050
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751246
Int. Cl.³ B63B *15/02*
U.S. Cl. 114—91 3 Claims



1. A device for connecting a sailmast to a sailboard, comprising a mast-connecting universal joint, which is connected at one end of the mast and which is connected at its other end to a supporting member, the supporting member when the device is in position for use being received at least in part by a first recess in the upper surface of the sailboard so as to be positively connected thereto, spring biasing means for constantly biasing the supporting member into contact with the sailboard so that the positive connection can be eliminated only when the force of the spring biasing means is overcome, the force when overcome tending to reestablish the positive connection between the supporting member and the sailboard, said sailboard having a second recess in its upper surface spaced from said first recess and a duct extending in the longitudinal direction of the sailboard interconnecting said recesses, said spring biasing means comprising a rubber spring positioned in said duct and having one end connected to said supporting member, a spring tightener adjustable in the longitudinal direction of the sailboard positioned in said second recess, and a flexible connecting element interconnecting said spring tightener with the other end of said rubber spring so that the force of said spring biasing means is adjusted by said spring tightener.

4,276,849

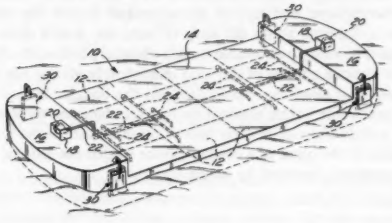
BALLAST CONTROL SYSTEM FOR SUBMERSIBLE VESSEL

Roger W. Bloxham, P.O. Box 304, Trabuco Canyon, Calif. 92678

Continuation-in-part of Ser. No. 933,591, Aug. 14, 1978, which is a continuation-in-part of Ser. No. 889,454, Mar. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 847,341, Oct. 31, 1977, abandoned. This application Oct. 5, 1979, Ser. No. 82,231

Int. Cl.³ B63B *43/06*

U.S. Cl. 114—125 **18 Claims**



1. In a submersible vessel, of the type having a hull and plural ballast compartments therein, and means for filling said compartments with water and evacuating water from said compartments by the application of predetermined negative and positive air pressure, respectively, the improvement comprising:

first means for conducting water from said ballast compartments to the exterior of said vessel through an outlet in response to said positive air pressure; and

second means for maintaining said outlet at a constant height above the level of water in said ballast compartments as said ballast compartments are evacuated, so that said predetermined positive air pressure can be held constant at a value sufficient to lift water to a height equal to or slightly greater than said constant height.

4,276,850

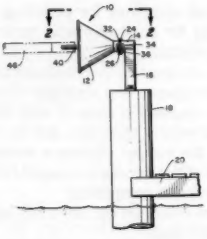
APPARATUS TO AID IN THE DOCKING AND MOORING OF A BOAT

C. Estaban Valencia, 495 Mariposa Dr., Ventura, Calif. 93003

Continuation-in-part of Ser. No. 916,267, Jun. 16, 1978, abandoned. This application Oct. 29, 1979, Ser. No. 89,283

Int. Cl.³ B63B *21/00*

U.S. Cl. 114—230 **2 Claims**



1. An apparatus to aid in the docking and mooring of a boat comprising:

a housing adapted to be secured to a fixed structure such as a piling, pier or the like;

an opening formed within said housing, said opening having an open front end;

guiding means connected to said housing and located about said opening, said guiding means adapted to direct a free end of an elongated member into said opening when such is moved in close proximity to said opening, said guiding means having an enlarged open outer end, said guiding means being in the shape of a funnel;

a latching means mounted on said housing connecting with said opening, said latching means being movable in respect to said opening between a latched position and an unlatched position, said latched position being when said latching means extends into said opening and said unlatched position being when said latching means is displaced from said opening, said latching means when at rest being normally located in said latched position, said latching means being continuously spring biased to said latched position;

actuation means to manually move said latching means from said latched position to said unlatched position;

an elongated member the free end of which is to be locatable within said opening, said free end being rigid, said latching means to connect with said free end of said elongated member in said latching position and secure said elongated member to said housing, said free end of said elongated member to be disconnectable from said housing, said elongated member being disconnected from said boat and adapted to be hand held by an occupant of said boat; and

said elongated member having an enlarged abutment means adjacent said free end, a lanyard means being attached to said abutment means and extending rearwardly therefrom, a tubular member having an end thereof engaging said abutment means and having an internal chamber, said lanyard means to be located within said internal chamber and to contact said abutment means, the cross-sectional area of said lanyard means being substantially smaller than the cross-sectional area of said internal chamber, said lanyard means to extend entirely through said tubular member, said tubular member to be readily disengaged from said abutment means and said lanyard means to be removed from said internal chamber of said tubular member with said tubular member to be then put aside and said lanyard means used by a boat occupant to move the boat to the mooring position.

4,276,851

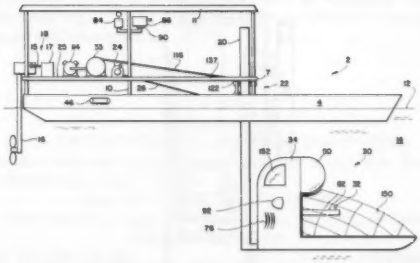
UNDERWATER CRUISE DEVICE

Jess A. Coleman, Rte. 1, Box 29, Dunnellon, Fla. 32630

Filed Aug. 10, 1979, Ser. No. 65,648

Int. Cl.³ B63G *8/00*; B63B *1/00*

U.S. Cl. 114—313 **38 Claims**



1. In an underwater cruise device including, a vessel floating on the surface of a body of water, a vertical boom slidably mounted to said vessel, a boom driving means connected between said vessel and said boom for selectively extending said boom vertically into said water, and a chair means mounted to said vertical boom for selective submersion of a diver seated thereon, in response to the operation of control means mounted to said chair means and operatively connected to said boom driving means, the improvement comprising:

a concave canopy mounted to said chair means having a

closed upper portion for containing a breathable gas ambient and an open lower portion for admitting the head of said seated diver;

whereby said diver can breathe said breathable gas ambient while seated in said submerged chair.

4,276,852

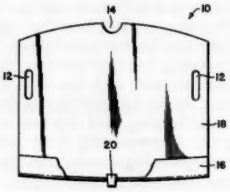
PAINTING AND MISTING SHIELD

Daisy E. Adams, 1415 E. Bethany Home Rd., #18, Phoenix, Ariz. 85014

Filed Aug. 3, 1979, Ser. No. 63,540

Int. Cl.³ B05C *15/00*

U.S. Cl. 118—326 **3 Claims**



1. A freely portable shield for capturing a sprayed liquid, comprising:

a portable upright spray catching member;

trough means connected to the bottom of said spray catching member for holding sprayed unused liquid; and

said upright spray catching member having a continuous uninterrupted concave curved surface located above said trough means.

4,276,853

EXPERIMENTAL PLANT FOR THE COATING AND DRYING OF MATERIAL IN THE FORM OF WEBS

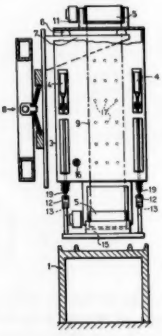
Hans Gref; Hans Hofmann, both of Cologne; Werner Zander, Leverkusen, and Josef Busch, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1979, Ser. No. 3,701

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802184

Int. Cl.³ B05C *3/172*

U.S. Cl. 118—643 **11 Claims**



1. An experimental plant for the of single or multiple coating of webs of paper or foil with viscous liquids, followed by drying, and subjected to vibration of machine and workroom, comprising at least one casting device for applying the liquid coating and a nozzle air drier with inertia free adjustability of the temperature and humidity parameters of the drying air, the experimental plant further comprising an elongated support means with guide elements for movably carrying an endless loop of web thereon past a said casting device, movable bracket means on the support means for disposing the support means and endless loop of web over one or more of said casting devices, means for individually moving a casting device into an operative position adjacent the endless loop for coating in a predetermined time sequence, detachable coupling means included in the support means for engaging a portion of the loop of the web which is to be coated to a casting device during the coating process, isolation means between the movable bracket means and the elongated support means for causing the casting device to be free from vibrations of the machine and workroom; and further characterized in that the nozzle drier is disposed about the loop of web, the nozzle drier is a channel having a removable nozzle channel portion for disposition about a portion of the loop immediately after it has been coated, and clamping means between the nozzle channel and the removable nozzle channel portion for clamping the removable nozzle channel portion into position as part of the nozzle channel in the place of a casting device so that the loop of web is completely covered by an air blast.

4,276,854

APPARATUS FOR DETECTING TONER DENSITY

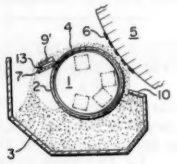
Hisao Fujita; Yasuhiko Tanaka; Isao Kobayashi, and Ken Nakamura, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1979, Ser. No. 93,809

Claims priority, application Japan, Nov. 15, 1978, 53/156048[U]

Int. Cl.³ B05C *11/00*; G03G *15/09*

U.S. Cl. 118—689 **4 Claims**



1. In an improved apparatus for detecting the density of toner in a developer for an electrostatic recording apparatus which includes an operatively movable surface for carrying developer onto an electrostatic latent image bearing member during image development, and a scraper element having at least a flat surface, disposed in contact with the movable surface for scraping developer therefrom and for directing along the flat surface of the scraper element a substantially steady and uniform stream of the developer scraped from the movable surface, the improvement comprising:

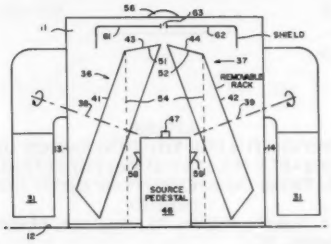
a substantially flat detection coil assembly having oppositely-directed faces; and

means for mounting said coil assembly on and in spaced apart relation to the flat surface of the scraper element and adjacent the movable surface such that said oppositely-directed faces are arranged substantially parallel to the flat surface and to the stream of scraped developer and such that the stream of developer is passed along both said coil assembly faces directly after being scraped from the movable surface whereby the toner density detection sensitivity of said coil assembly is significantly enhanced.

4,276,855
COATING APPARATUS

Richard I. Seddon, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed May 2, 1979, Ser. No. 35,396
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—719 **10 Claims**

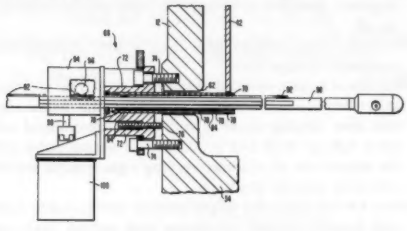


1. In a coating apparatus, a housing, means for establishing a vacuum in the housing, a source of coating material mounted in the housing for providing a vapor stream having approximately a cosine distribution, at least one rotor mounted in the housing for rotation about an axis which is offset from the horizontal by less than 45°, said rotor extending above and below the source and having a generally circular rack, said rack having interior substrates carrying surfaces facing the axis of rotation and overlying the vapor sources at least part of the time that the rotor is rotated, said rack having a dimension parallel to the axis of rotation which is such so that an imaginary line extending vertically from the innermost extremity of the rack at the top portion thereof clears the outer extremity of the bottom portion of the rack whereby debris falling downwardly by force of gravity from the top portion of the rack will clear the lower portion of the rack.

4,276,856
STEAM GENERATOR SLUDGE LANCING METHOD

Thomas H. Dent, Greensburg; Diane E. Jordan, Irwin; William E. King, McCandless Twp., Allegheny County, and Frank W. Rieger, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 28, 1978, Ser. No. 974,177
Int. Cl.³ F22B *37/52, 37/54*
U.S. Cl. 122—382 **9 Claims**



1. A method for removing sludge deposits from a steam generator comprising the steps of:

inserting fluid injection apparatus into said steam generator near the base thereof;

placing fluid suction apparatus in said steam generator in a position substantially opposite said fluid injection apparatus;

positioning a movable fluid lance in said steam generator near said base;

supplying a first fluid to said fluid injection apparatus at between approximately 35 to 45 gpm and establishing a peripheral fluid stream from said fluid injection apparatus to said fluid suction apparatus;

supplying a second fluid to said fluid lance and causing said fluid lance to emit pulses of fluid with each pulse being approximately 14–16 gpm and having a pulse length of approximately 3–7 seconds and simultaneously discharging the same along said base dislodging said sludge deposit while forming a sludge-fluid mixture that becomes entrained in said peripheral fluid stream;

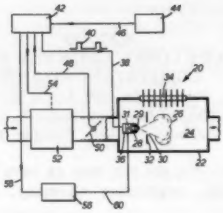
moving said fluid lance in a linear direction along said base; and

discharging said mixture into said fluid suction apparatus.

4,276,857
BOILER CONTROL SYSTEMS

Barrie J. Martin, Shenfield, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 19, 1979, Ser. No. 50,056
Claims priority, application United Kingdom, Jun. 20, 1978, 27341/78
Int. Cl.³ F22B *37/42*
U.S. Cl. 122—448 R **9 Claims**



1. An oil-burner system for heating a boiler, comprising a combustion chamber, a burner, constituted by an electrically operated injection device, for injecting fuel oil into the combustion chamber, and electric-circuit means establishing, when connected to an electric-power supply, a circuit for energising the injecting device; said circuit means including switching means operative to periodically close and open such circuit for periodic energisation of the injecting device at a frequency high enough to ensure the maintenance of a steady flame in the combustion chamber, and control means co-operating with said switching means to adjustably vary the ON/OFF ratio of the periodic energisation.

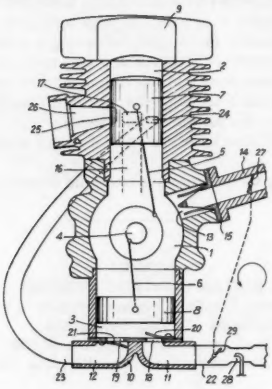
4,276,858
TWO-CYCLE INTERNAL COMBUSTION ENGINE

Christian Jaulmes, Paris, France, assignor to Ateliers de la Motobecane, Pantin, France

Filed Feb. 1, 1980, Ser. No. 117,557
Claims priority, application France, Feb. 26, 1979, 79 04842
Int. Cl.³ F02B *33/04*
U.S. Cl. 123—73 CC **9 Claims**

1. A two cycle internal combustion engine comprising at least one power cylinder; a drive piston in said power cylinder; at least one auxiliary cylinder; at least one first transfer duct extending between said auxiliary cylinder and said power cylinder; at least one second transfer duct extending between said pump crankcase and said power cylinder; means for intaking carburetted air into said auxiliary cylinder; means for intaking pure air into said pump crankcase; an exhaust port from said power cylinder; a scavenging intake port opening into said power cylinder; and a carburetted air intake port opening into

said power cylinder, said exhaust port, said scavenging port and said carburetted air inlet port being so positioned that said



scavenging port starts to open after said exhaust port and before said carburetted air intake port.

4,276,859

PRESSURE LUBRICATION FOR INTERNAL COMBUSTION ENGINES

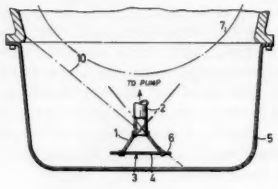
Kurt Streicher, Heppenheim, and Achim zur Nieden, Cologne, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Division of Ser. No. 685,752, May 13, 1976. This application Claims priority, application Germany, May 22, 1975, 2522605

Jan. 16, 1980, Ser. No. 112,648

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 R **2 Claims**



1. A pressure lubricating system for an internal combustion engine, which includes in combination: an oil pan for receiving and storing lubricating oil, a suction conduit connectable to a pump and extending into said oil pan in the central longitudinal plane of said engine and having an inlet opening at its lower end immersed into lubricating oil below the normal level of oil in said oil pan, said suction conduit for air-free suction including a slim funnel-shaped intake with its largest inside cross section amounting to only about five times that of the cross section of the suction conduit portion adjacent said funnel-shaped intake for a cross-sectional surface ratio of 1:5, said funnel-shaped intake having an inlet opening defined by an annular outer surface with a perimeter terminating in an enlarged end thereof, and a flat, disc-shaped member extending only outwardly beyond the perimeter of the outer surface of said funnel-shaped intake and having a flow stabilizing effect to assure that fewer air bubbles are taken along as well as for avoiding of air suctioning during low oil level and inclined positioning of said funnel-shaped intake to attain air-bubble-free flow, said funnel-shaped intake having an acute flat conical angle smaller than 90° for span of said disc-shaped member, the inner diameter of said disc-shaped member at least approximately equalling the greatest inner diameter of said funnel-shaped intake.

4,276,860

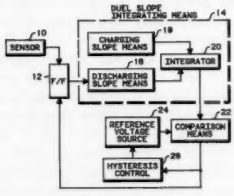
APPARATUS FOR THE GENERATION OF MONOSTABLE PULSES HAVING PREDETERMINED DURATIONS INDEPENDENT OF INPUT SIGNAL PERIOD

Zbynek A. Capurka, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1979, Ser. No. 90,209

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—415 **10 Claims**



1. An apparatus for generating selectable duration periodic pulses comprising:

sensor means producing periodic sensor signals having a variable period;

bi-stable flip-flop means, coupled to said input sensor means, said flip-flop means capable of producing a first and second logic state signals and producing said first logic state signal in response to each periodic sensor signal;

dual slope rate means, coupled to said bi-stable flip-flop means, producing a time varying signal at a first predetermined rate in one direction in response to said first logic state signal and at a second predetermined rate in the opposite direction in response to said second logic state signal;

reference source means providing a first predetermined reference voltage level;

comparator means, coupled to said dual slope rate means and said reference source means, comparing the magnitude of said time varying signal to said first predetermined reference voltage level and producing an output pulse when the magnitude of said time varying signal equals said first reference voltage level;

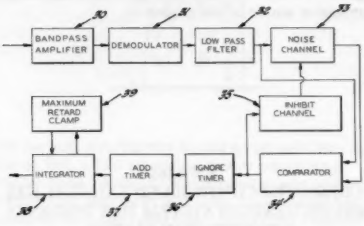
means for coupling said output pulse to said bi-stable means, said bi-stable means producing said second logic state signal in response to the initiation of said output pulse and maintaining said second logic state signal until a subsequent sensor signal is received, whereby said first and second logic state signals have durations equal to a predetermined percentages of the variable period of said periodic sensor signals; and

hysteresis means, responsive to said comparator means and coupled to said reference source means, for adjusting the magnitude of the reference voltage level to a second predetermined voltage level, whereby the duration of the output pulses produced by said comparator is selectable and independent of the period of the sensor signal.

4,276,861
ENGINE KNOCK CONTROL WITH KNOCK PULSE DURATION ADJUSTMENT

Mark B. Kearney; Kenneth D. Mowery, both of Kokomo, and L. Joseph Pechous, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 14, 1980, Ser. No. 149,644
Int. Cl.³ F02P *5/04*; F02B *33/00*
U.S. Cl. 123—425 **6 Claims**



1. In combination:

a vehicle mounted, spark ignited internal combustion engine of the type which occasionally exhibits bursts of knock induced engine vibrations, the knock induced vibration bursts being of varying intensity and being characterized by durations varying directly with said intensity;

first means effective to sense the knock induced vibration bursts and generate pulses having durations varying directly with the durations of the bursts;

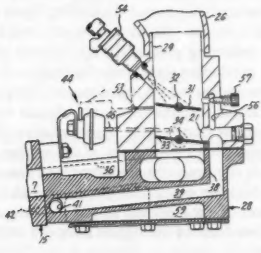
second means effective to lengthen selected ones of the pulses by a common predetermined duration, whereby the ratio of durations between the shorter pulses indicating less intense knock and the longer pulses indicating more intense knock is decreased; and

third means effective, at least at some times, to control a knock reducing parameter of said engine in response to the lengthened pulses to limit knock intensity, whereby the reduced ratio of duration between shorter and longer pulses provides more effective control of both less and more intense knock.

4,276,862
INTERNAL COMBUSTION ENGINE OF FUEL INJECTION TYPE

Hiromitsu Matsumoto, Hamamatsu, Japan, assignor to Yamaha Hatsukoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 17, 1979, Ser. No. 58,253
Claims priority, application Japan, Jul. 17, 1978, 53-87398
Int. Cl.³ F02B *29/00*; F02D *9/08*; F02M *51/02*
U.S. Cl. 123—432 **22 Claims**

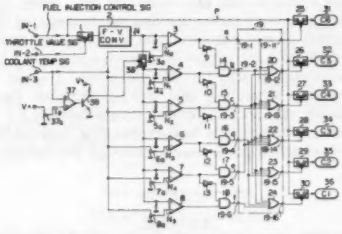


1. In an internal combustion engine having a variable volume chamber in which combustion ocurs, a main intake port, a main intake passage communicating with said chamber through said main intake port for delivering a charge thereto, an auxiliary intake port, an auxiliary intake passage inlet, and an auxiliary intake passage communicating said auxiliary intake passage inlet with said chamber through said auxiliary intake port, said auxiliary intake passage having an effective cross sectional area substantially less than the effective cross sectional area of said main intake passage for causing a given mass flow of charge through the said auxiliary intake port to enter said chamber at a substantially greater velocity, and valve means for controlling the ratio of communication of said ports with said chamber during a given cycle of operation of said engine, said auxiliary passage inlet being in communication with said main intake passage, the improvement comprising a fuel injection nozzle discharging into said main intake passage and means for directing the outlet spray from said fuel injection nozzle in a direction where the major portion of the spray therefrom is directed toward said auxiliary intake passage inlet.

4,276,863
APPARATUS FOR CONTROLLING THE NUMBER OF ENABLED CYLINDERS OF AN INTERNAL COMBUSTION ENGINE UPON DECELERATION

Fukashi Sugasawa, Yokohama; Haruhiko Iizuka, and Junichiro Matsumoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 30, 1979, Ser. No. 34,285
Claims priority, application Japan, May 12, 1978, 53-56892
Int. Cl.³ F02D *17/00*
U.S. Cl. 123—481 **20 Claims**



1. Apparatus for controlling the number of enabled cylinders of an internal combustion engine having a plurality of cylinders during deceleration, comprising:

(a) first means for producing a first signal indicative of the rotational speed of a crankshaft of said engine;

(b) second means for producing a second signal indicative of deceleration of said engine;

(c) a plurality of threshold detecting circuits having respective inputs and outputs, said inputs being connected to said first means for producing respective output signals responsive to said first signal at each of said outputs, the thresholds of said detecting circuits being arranged stepwise;

(d) a plurality of switching means responsive to the output signals of said threshold detecting circuits for stepwise increasing the number of enabled cylinders as said engine decelerates;

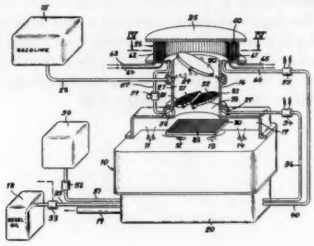
(e) third means responsive to said second signal for enabling the stepwise increase upon deceleration of said engine; and

(f) means for varying the thresholds of said threshold detecting circuits in accordance with the engine temperature.

4,276,864
FUEL-VAPORIZING SYSTEM FOR INTERNAL-COMBUSTION ENGINE AND METHOD OF OPERATING SAME

Gerhard Waschkuttis, 19800 NE. 14th Ave., North Miami Beach, Fla. 33179

Filed Feb. 9, 1979, Ser. No. 10,993
Int. Cl.[3] F02M *31/00*
U.S. Cl. 123—544 21 Claims



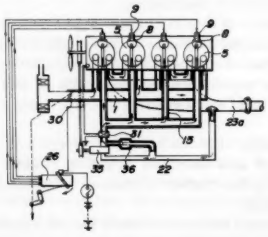
1. In an internal-combustion engine comprising a set of combustion cylinders provided with an intake manifold for the aspiration of an air/fuel mixture and an exhaust manifold for the discharge of hot combustion gases, a carburetor forming a mixing chamber which opens into an entrance of said intake manifold, a throttle valve in said carburetor separating said mixing chamber from said entrance, and storage means for holding a supply of liquid fuel to be aspirated in vaporized form into said mixing chamber for admixture with an air stream drawn into said intake manifold,

the improvement wherein said storage means comprises a main fuel tank to be filled with a relatively light hydrocarbon and an ancillary fuel tank to be filled with a relatively heavy hydrocarbon, said main fuel tank being provided with first conduit means opening into said mixing chamber upstream of said entrance, said ancillary fuel tank being provided with second conduit means opening at a location downstream of said throttle valve into a space of said carburetor separating said mixing chamber from said entrance, said second conduit means including a boiling chamber positioned in heat-exchanging relationship with the combustion gases passing through said exhaust manifold.

4,276,865
DIESEL ENGINE HAVING A SUBCHAMBER

Kyugo Hamai, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 15, 1979, Ser. No. 48,784
Claims priority, application Japan, Jun. 22, 1978, 53/75578
Int. Cl.[3] F02B *47/08*
U.S. Cl. 123—569 5 Claims

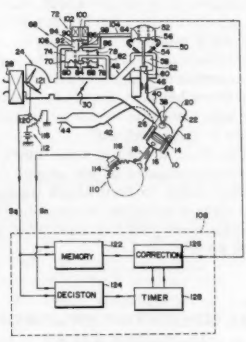


1. A Diesel engine having a subchamber in its cylinder head, comprising an exhaust gas recirculating passageway connecting an exhaust system of the engine to said subchamber for recirculating an exhaust gas of the engine, valve means operating in synchronism with rotation of said engine to open and to close said recirculating gas passageway, wherein the exhaust gas recirculating passageway is interposed with a pump driven in synchronism with the engine rotation, and controlling means for adjusting an amount of said recirculating exhaust gas in response to respective load conditions of the engine, wherein the exhaust gas recirculation is effected during a term starting from suction stroke of the engine to a beginning period of compression stroke of the engine.

4,276,866
COMPUTER-CONTROLLED EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kazuhiro Higashiyama, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 26, 1979, Ser. No. 97,386
Claims priority, application Japan, Dec. 6, 1978, 53-151443
Int. Cl.[3] F02B *47/08;* F02M *25/06*
U.S. Cl. 123—571 11 Claims



1. In an internal combustion engine having an air-fuel mixture supply system, an exhaust system and an exhaust gas recirculation system including exhaust gas recirculation passageway means for providing communication between the exhaust system and the mixture supply system, and valve means operative to vary the recirculation rate of exhaust gases through said passageway means depending upon a signal supplied to the valve means, the improvement comprising detecting means for detecting prescribed operational parameters of the engine and producing signals representative of the detected operational parameters, and control means comprising

a decision circuit responsive to said signals for producing either of signals respectively representative of at least two predetermined load conditions of the engine,

a timer circuit responsive to predetermined one of the signals from the decision circuit for producing an output signal for a period of time related to the time duration of said predetermined one of the signals from the decision circuit, and

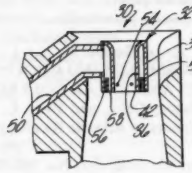
control signal delivery means responsive to the signals from said detecting means and the signal from said timer circuit for supplying to said valve means a control signal dictated by the signals from the detecting means and corrected by the signal from the timer circuit.

4,276,867

FUEL ATOMIZING DEVICE

Dieter W. Metzenthin, 5916 Wayburn, Detroit, Mich. 48224

Filed Mar. 19, 1979, Ser. No. 21,992
Int. Cl.³ F02M 29/00
U.S. Cl. 123—590 6 Claims



1. For use with a carburetor having an air induction tube and a source of fuel, a fuel atomizing device comprising:

a tubular body having an inner tubular part and an outer tubular part, said inner part being coaxial with but spaced inwardly from said outer part and forming a tubular chamber therebetween the inner periphery of said inner part forming a through bore which extends entirely through said body,

said chamber being closed at one end of the body; said inner and outer parts being spaced apart from each other at the other end of the body thus forming a slot therebetween, said slot being open to the tubular chamber;

said body being coaxially disposed within the air induction tube so that said one end of the body faces upstream and so that said slot faces downstream in said induction tube whereby air flow through the induction tube flows both around the outer periphery of the tubular body and through said body through bore and around both the inner and outer sides of said slot; and

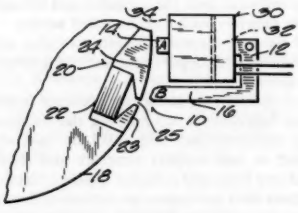
means for fluidly connecting said chamber within said fuel source.

4,276,868

CAPACITOR DISCHARGE IGNITION SYSTEM HAVING AUTOMATIC SPARK ADVANCE

Thomas W. Burrows, West Allis, and David T. Cavil, Menomonee Falls, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 1, 1978, Ser. No. 956,658
Int. Cl.³ F02D 3/06
U.S. Cl. 123—602 11 Claims



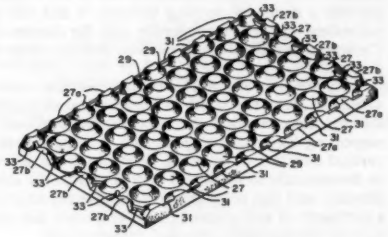
1. A capacitor discharge ignition system comprising a generally U-shaped magnetic core having a pair of legs spaced apart at a first distance, a rotatable member including magnet means having first and second pole shoes spaced apart and located for movement past said spaced legs, said second pole shoe having a length greater than said first distance and trailing said first pole shoe relative to a normal direction of rotation of said rotatable member, and ignition circuit means including a charge capacitor, switch means for selectively discharging said capacitor to effect ignition, and coil means wound on the one of said magnetic core legs which is first approached by said magnet means during normal rotation of said rotatable member and responsive to each passage of said magnet means past said core for sequentially charging said charge capacitor and operating said switch means to discharge said capacitor to effect ignition so as to provide a single discrete advance in the time of ignition distinct from gradual advance in the time of ignition resulting from increased rotational speed of said rotatable member, said single discrete advance occurring in response to increased rotational speed of said rotatable member above a predetermined lower speed.

4,276,869

BARBECUE GRILL SLAB

Eugene F. Kern, 12115 Lake Meade Ct., Creve Coeur, Mo. 63141

Filed Apr. 16, 1979, Ser. No. 30,532
Int. Cl.³ A47J 37/00; F24C 3/04
U.S. Cl. 126—41 R 7 Claims



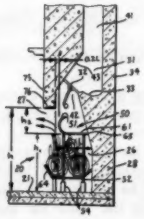
1. A molded refractory slab for positioning in a barbecue grill between the burner unit and the food-supporting grate having fluid retaining means for containing grease and rendered meat juices on the slab and preventing such fluids from dripping off the slab, said fluid retaining means including a plurality of uniformly spaced bosses simulating coals projecting upwardly from the slab top surface, and integral dam means connecting adjacent bosses nearest the periphery of the slab to form an upstanding continuous peripheral parapet around the slab periphery to contain grease and rendered meat juices on top of the slab and prevent such fluids from dripping off the sides of the slab.

4,276,870

FIREPLACE DEVICE

Charles B. Heard, Jr., 569 Brandy Creek Cir., Lawrenceville, Ga. 30245

Filed Feb. 26, 1980, Ser. No. 124,815
Int. Cl.³ F24C 15/22
U.S. Cl. 126—141 2 Claims



1. A device which is adapted to be supported from a hearth of a fireplace to heat a room into which the fireplace faces, the fireplace including a firebox having a rear wall, side walls, and a flue that is connected through a damper to the firebox, said device comprising:

a heat energy conductor adapted to be interposed between a hearth and a damper and extending longitudinally in a direction between side walls of the fireplace for causing air heated by an energy source to be directed toward the room and for causing substantial heat energy to be radiated therefrom, said conductor including:

an elongated planar portion adapted to assume a substantially horizontal position in a firebox, said planar portion having one longitudinal edge adapted to be adjacent to a rear wall of the firebox and another longitudinal edge between the rear wall and the room into which the fireplace faces, said planar portion having lateral edge surfaces extending between said longitudinal edges and being spaced from side walls of the fireplace; and

a convexly curved portion having one longitudinal edge connected to the other longitudinal edge of said planar portion and another longitudinal edge unattached with its center of curvature being between it and the rear wall, said curved portion adapted to be positioned a selected distance from an upper depending wall of the fireplace to provide a continual opening between it and the upper depending wall which cooperates with the damper above the firebox to control the air currents from the room to the flue; and

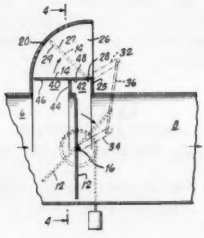
a plurality of supporting legs for holding said heat conductor a distance above the hearth to space said curved portion a selected distance from the upper depending wall, said supporting legs each being capable of being moved in a vertical direction to move said heat conductor upwardly or downwardly to space said curved portion the selected distance, said legs being distributed generally adjacent to a perimeter of said planar portion to permit said legs to have an energy source disposed therebetween.

4,276,871

FLUE DAMPER AND DRAFT REGULATOR

Herbert Lindtveit, West Hempstead, N.Y., assignor to Sid Harvey, Inc., Valley Stream, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,057
Int. Cl.³ F23L *3/00*
U.S. Cl. 126—292 **7 Claims**



1. A draft regulator for a furnace, comprising:

(a) a smoke pipe;

(b) a damper in the smoke pipe operable between open and closed positions;

(c) a shaft supporting the damper in the smoke pipe;

(d) a casing in fluid communication with said smoke pipe;

(e) a movable vane within said casing, said vane having an outer face and an inner face, the outer face being subject to atmospheric pressure outside the smoke pipe, the inner face being subject to the pressure inside the smoke pipe;

(f) means supporting the vane for movement within the casing;

(g) a partition separating a portion of the casing into an upstream duct communicating with the smoke pipe upstream from the damper and a downstream duct communicating with the smoke pipe downstream from the damper, said partition serving as an abutment to engage the vane when the damper is in the closed position, so that a portion of the inner face of the vane is then subject to the upstream pressure and another portion is subject to the downstream pressure; and

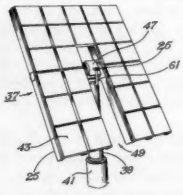
(h) means connecting the vane to the damper for concurrent movement, said vane acting in a direction to close the damper when the atmospheric pressure exceeds the pressure inside the smoke pipe.

4,276,872

SOLAR SYSTEM EMPLOYING GROUND LEVEL HELIOSTATS AND SOLAR COLLECTORS

Floyd A. Blake, Littleton, Colo., and Lynn L. Northrup, Jr., Hutchins, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 13, 1978, Ser. No. 960,307
Int. Cl.³ F24J *3/02*; G01J *1/20*; G03B *21/00*
U.S. Cl. 126—425 **5 Claims**



1. In a combination employing solar energy, disposed on the surface and exposed to the sun and having:

a. at least one energy receiving collector for receiving and using radiant energy from the sun; and

b. at least one reflector means for reflecting said radiant energy from the sun on said collectors:

the improvement comprising:

c. having said at least one energy receiving collector comprise a plurality of towerless collectors that are disposed at substantially the same level as respective said reflector means that reflect onto it;

d. having respective said reflector means comprise a plurality of towerless heliostats that are disposed at substantially the same level as the respective said collector onto which they reflect said radiant energy; said heliostats being moveable to maximize their radiant energy reflected onto said collector; each said heliostat being configured so as to avoid interference with a co-mounted sensor;

e. a means for moving said heliostat to maximize said radiant energy reflected onto the collector and through arcs that will not interfere with a co-mounted sensor;

f. a dual purpose support structure carrying said heliostat and a sensor; said support structure being firmly anchored in the surface; and

g. a sensor controllably connected with said means for moving said heliostat for maintaining the maximum radiant energy reflected onto said collector; said sensor being mounted on said support structure and aligned with a straight line from said heliostat to said collector such that said sensor does not require an expensive, firmly anchored separate support structure to prevent receiving small surface movements different from those received by said heliostat;

said heliostat having a central reflector; said sensor being cantilevered from said support structure below said central reflector and aligned between the center of said central reflector and said collector; said heliostat having a slot below said central reflector so as to be pivotal through an arc without hitting said support structure, said sensor and said cantilevered mountings; said heliostat being pivotally movable about a horizontal axis through said central reflector; said means moving said heliostat including an elevation drive means for pivoting said heliostat to a desired angle about said horizontal axis;

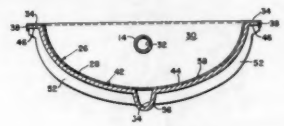
said heliostat being rotatable about a vertical axis through said central reflector and said means for moving said heliostat including a rotation means for rotating said heliostat through a limited arc about said vertical axis.

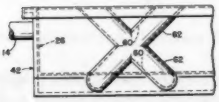
4,276,873

REFLECTORS FOR SOLAR ENERGY COLLECTORS

Miroslav Uroshevich, Cincinnati, Ohio, assignor to Alpha Solarco Inc., Cincinnati, Ohio

Filed Jun. 25, 1979, Ser. No. 52,090
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—438 **3 Claims**





1. In a focusing solar energy collector, a reflector assembly comprising:

an elongated, relatively thin, vacuum formed sheet defining a reflective surface having a uniform parabolic cross sectional configuration and integral end walls forming a trough like element for reflecting and focusing the beam component of solar radiation, said thin sheet having an integral perimeter flange and a perimeter wall extending at a right angle to said perimeter flange;

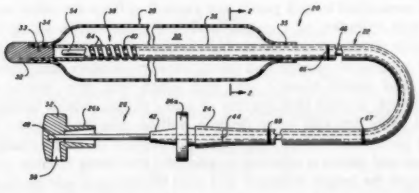
an elongated structural sheet conforming to and supporting the thin sheet, said structural sheet having integral end walls to form a trough like element into which said thin sheet is nestled and an integral perimeter flange abutting said perimeter flange of said thin sheet, said perimeter wall of said thin sheet being positioned to extend over said perimeter flange of said structural sheet, said structural sheet further having an integral depression extending away from said thin sheet to form an elongated central rib and a plurality of integral depressions extending away from the thin sheet to form raised elongated ribs connecting with said central rib and extending to said perimeter flange of said structural sheet for stiffening said structural sheet.

4,276,874

ELONGATABLE BALLOON CATHETER

Sidney Wolvek, Brooklyn, N.Y., and Bruce L. Hanson, Wayne, N.J., assignors to Datascope Corp., Paramus, N.J.

Filed Nov. 15, 1978, Ser. No. 960,789
Int. Cl.³ A61B *19/00*; A61M *25/00*
U.S. Cl. 128—1 D **18 Claims**



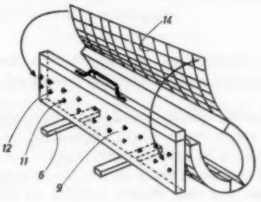
1. A catheter comprising an inflatable and deflatable chamber having a proximal end and a distal end, said chamber in use being adapted to have substantially the same surface area when inflated and when deflated, a catheter tube portion having a passage communicating with the interior of said chamber for admitting fluid into and withdrawing fluid from said chamber, means extending in said chamber substantially to said distal end of said chamber for supporting said chamber, said supporting means, said catheter tube portion, and said chamber being connected substantially at said proximal end of said chamber, said supporting means and said chamber being connected substantially at said distal end of said chamber, said chamber being sealed substantially at said proximal and distal ends thereof, said supporting means within said chamber having at least one space therein which at least partially extends transversely of said supporting means and means for selectively increasing said space substantially axially of said supporting means to thereby elongate said supporting means sufficiently to elongate said chamber and transversely decrease the size of said chamber, whereby insertion of said catheter into a body passageway or the like is substantially aided.

4,276,875

SPLINT FOR EXTREMITIES

Jan Sandegard, S-830 43 As, Prästgarden, Sweden

Filed Apr. 4, 1979, Ser. No. 27,094
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—89 R **10 Claims**



1. A medical splint for application to at least one injured extremity for the support and fixation of the latter, comprising: a substantially rigid, elongated frame having upper and lower longitudinal edge portions, and a wrapping element having four pairwise opposite edge portions, a first of said edge portions being connected to said frame and extending substantially parallel to and adjacent said upper edge portion, a second edge portion opposite said first edge portion being adapted to be applied to said upper longitudinal edge portion and releasably attached to said frame, fastening means at said frame for attaching said second edge portion to said frame, said wrapping element being selectively movable from a first position to a second position, and vice versa, in said first position said wrapping element forming a spread-out surface with said second edge portion in unattached condition, on which surface the extremity may be placed, in said second position said wrapping element being wrapped around the extremity and forming a sling hanging down from said upper edge portion, with the frame positioned outside the sling.

4,276,876

RESPIRATOR APPARATUS

Taisto Häkkinen, Kaarlonkatu 25, 13210 Hämeenlinna 21, Finland

Filed Apr. 17, 1979, Ser. No. 30,843
Claims priority, application Finland, Apr. 18, 1978, 781170
Int. Cl.³ A61M *11/00*
U.S. Cl. 128—200.14 **8 Claims**

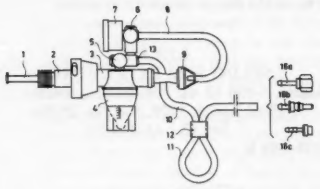
1. Modular respirator system apparatus for assisting in the respiration of a patient who, for example, is indisposed, unconscious or whose lungs are damaged or otherwise diseased, comprising:

a basic assembly comprising drug atomizing means having an outlet and atomizer control valve means attached to

said drug atomizing means for regulating a flow of oxygen or air into said drug atomizing means, said atomizer control valve means having an entrance connector fitting provided thereon for conducting air or oxygen into said control valve means, and a first flexible tubular connector having one end attached to said entrance connector fitting of said atomizer control valve means and the other end adapted to be connected to a pressure supply source;

valve means for controlling respiration pressure detachably connected to said atomizer control valve means of said modular system, said respiration pressure control valve means including pressure gauge means for monitoring the respiration pressure at which the respirator operates;

means for detachably connecting said respiration pressure control valve means to said atomizer control valve means so that the former can be selectively connected to or detached from the latter;



an injector member one end of which is detachably connected to said drug atomizing means of said modular system;

a second flexible tubular connector which, when said respiration pressure control valve means and injector member are connected to said atomizer control valve means and said drug atomizing means of said modular system, respectively, has one end fluidly coupled to said respiration pressure control valve means and its other end fluidly coupled to the other end of said injector member;

expiration valve means for steplessly adjusting the counterpressure presented to the patient's expiration, said expiration valve means being fluidly detachably connectable between the outlet of said drug atomizing means and a mouthpiece; and

a mouthpiece having one end fluidly detachably connected to said expiration valve means.

4,276,877

RESPIRATORY METHOD AND APPARATUS

Manfred Gdulla, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

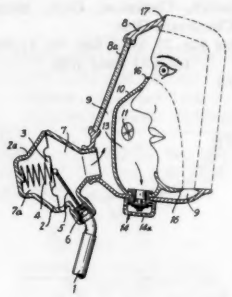
Filed Dec. 18, 1979, Ser. No. 104,881

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908528

Int. Cl.³ A62B *7/04*

U.S. Cl. 128—200.27 **6 Claims**

1. A breathing apparatus, comprising wall means forming a larger outer mask dimensioned to fit over the face of a user, and a smaller inner mask dimensioned to cover only the external respiratory organs of the user and to subdivide the space within the outer mask into an inner chamber adapted to communicate with the external respiratory organs, and an outer chamber about said inner chamber and adapted to be at superatmospheric pressure; control means operative for communicating said chambers with one another in response to suction created by inhaling so that the inhaled air from said inner chamber is replenished by air entering from said outer chamber and for interrupting such communication in response to pressure created in said inner chamber by exhaling; demand-valve means for admitting air into said outer chamber in response to a pressure drop in said outer chamber which results upon communication of said outer chamber with said inner chamber; and venting means for venting exhaled air from said inner chamber to the ambient atmosphere; said control means comprising at least one control valve in said wall means between said inner and outer chambers, including a valve member movable between an open and a closed position and means urging said valve member to said closed position with a force



exceeding substantially the force applied to said valve member by said super-atmospheric pressure present in said outer chamber, so that the user is required to exert only the normal inhaling pressure drop when breathing in for opening said control valve, said control valve closing immediately upon exhaling so that the user is required to overcome only the normal exhaling resistance of said venting means.

4,276,878

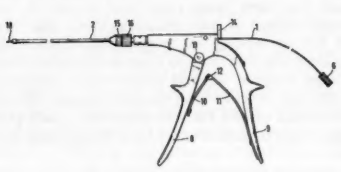
INJECTION SYRINGE

Karl Storz, Auf dem Schildrain 39, 7200 Tuttlingen, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 67,812

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—218 PA **14 Claims**



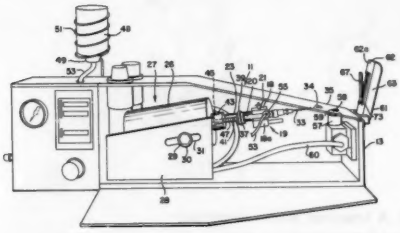
1. An injection syringe for injection of high viscosity pastes comprising: a frame; a pair of handles mounted to said frame, at least one of which is pivotally mounted to said frame, said handles comprising grip means which can be squeezed to move the handles toward one another; an elongated cylinder mounted to and projecting beyond said frame having a first end spaced from said frame to which an injection cannula can be mounted; a piston slidably fitted in said cylinder; a piston rod connected to said piston and extending from the other end of said cylinder, said piston having discontinuities along its length; piston advancing means connected to said grip means and adapted to engage said discontinuities to move said piston rod and piston toward said end when said grip means is squeezed, at least that portion of said cylinder which is adjacent to its first end being flexible, and at least that portion of said piston rod which occupies said portion of said cylinder when said piston is adjacent to said first end being flexible, the ratio of the length diameter and wall thickness of said portion of said cylinder being such that said cylinder with the rod inside it can be bent and still allow the advance of the piston rod and piston to eject paste from said cylinder through said cannula.

4,276,879

AUTOMATIC INJECTION APPARATUS

Costas Yiournas, Vineland, N.J., assignor to Vineland Laboratories, Inc., Vineland, N.J.

Filed Mar. 14, 1980, Ser. No. 130,406
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—218 A **3 Claims**



1. In an automatic apparatus for injecting fluids into animals, having:

a housing having a planar work surface;

a reservoir of fluid;

a hypodermic syringe supplied with fluid by said reservoir, the hypodermic needle of said syringe being positioned opposite an opening in said planar work surface, the axis of stroke of said hypodermic needle being at an acute angle with respect to said work surface;

syringe drive means for cyclically moving said syringe from a retracted to an extended position so as to reciprocate said needle through said opening, said drive means actuating said syringe while in said extended position;

switch means for cycling said syringe drive means, the actuating member of said switch means protruding through said work surface adjacent said opening; the improvement comprising:

a rigid retention plate hindedly joined at its bottom end to said work surface, said retention plate being pivotable about said hinged joint from a lowered position against said work surface, said retention plate having,

a planar bottom surface which conforms generally to said planar work surface when said retention plate is in said lowered position,

a cylindrically curved top surface for accepting the animal member to be injected,

side retaining walls extending upwardly from opposite sides of said planar bottom surface,

a spring member for biasing said retention plate away from said lowered position, and

an elongated aperture through said retention plate,

said retention plate being located on said sloped surface whereby said aperture is aligned with said opening to allow passage of said needle therethrough, and whereby lowering said retention plate to said lowered position causes said retention plate botton surface to operate said actuating member of said switch means.

4,276,880

CANNULA AND PROCESS

Oscar Malmin, 127 E. Wayne St., Akron, Ohio 44301

Continuation-in-part of Ser. No. 942,370, Sep. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 789,667, Apr. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 766,013, Feb. 7, 1977, abandoned. This application Dec. 14, 1979, Ser. No. 103,935
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—221 **14 Claims**

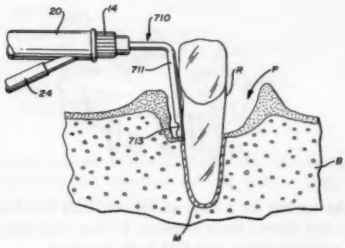
1. A cannula for attachment to and use with an instrument capable of selectively supplying fluid under pressure and a suction force, comprising:

(A) an elongate, cylindrical, rigid body having a central, longitudinally extending bore and having first and second ends;

(B) said central bore opening into said first end of said body;

(C) said second end of said body being closed smooth, and rounded;

(D) said body being imperforate throughout substantially its entire length;



(E) said body having only one elongate opening in its wall with one end thereof being disposed in close adjacency with said closed end; and

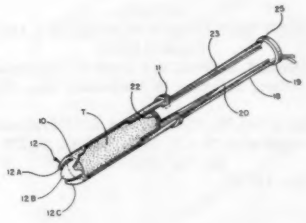
(F) attachment means carried by said first end for releasable engagement with said instrument.

4,276,881

COMPACT TAMPON APPLICATOR

Amnuey Lilaonitkul, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 22, 1979, Ser. No. 86,810
Int. Cl.³ A61F *15/00*
U.S. Cl. 128—263 **9 Claims**



1. A tampon applicator comprising in combination:

an outer tube, having:

a forward end for delivery of a tampon;

a rearward end with an open base for receiving an inner tube;

an inner surface; and

injection guide means on said inner surface tapering inwardly longitudinally toward said forward end of said outer tube from an area substantially at said base to a situs slightly above said base; and

an inner tube of substantially the same length of the outer tube and the tampon to be inserted by said applicator for slidable mating in said outer tube said inner tube having:

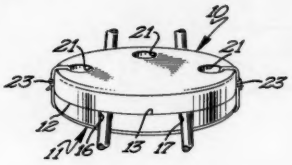
a forward end and a rearward end corresponding to the forward and rearward ends of the outer tube when mated; and

a radially compressible means at least at the forward end of said inner tube compressed by said injection guide means during withdrawal of the inner tube from the outer tube, comprising a pair of inwardly and downwardly tapering slots at either side of said flanges, said slots having stops located near the rearward edge of the inner tube.

4,276,882
LEAD ANCHORING DEVICE

Eugene A. Dickhudt, St. Paul, and Charles D. Ray, Long Lake, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 18, 1979, Ser. No. 40,285
Int. Cl.[3] A61N *1/04*
U.S. Cl. 128—419 P 10 Claims

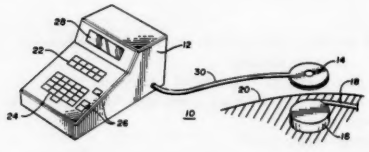


1. An anchor for a body stimulation lead which comprises:
first and second body members having opposing surfaces;
an aperture within said first body member;
a post extending from said opposing surface of said second body member into said first body member aperture, at least a portion of said post being slightly larger than said aperture to establish a press fit therein;
at least one groove within at least one of said body member opposing surfaces, said groove having a groove opening and a groove depth and being adapted to accept a body stimulation lead of known generally circular cross section, the groove opening being no greater than the lead diameter and the groove depth being at least as great as the lead radius; and
suture cooperating means within said first and second body members.

4,276,883
BATTERY MONITOR FOR DIGITAL CARDIAC PACEMAKER

Ray S. McDonald, St. Paul, and David L. Thompson, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 958,211, Nov. 6, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,279
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—419 PT 21 Claims



1. A body-implantable medical device adapted to periodically treat the body comprising:
battery means for supplying energy to said device, said battery means having a characteristic such that the energy provided thereby decreases with time;
controllable timing means for establishing a parameter of the periodic treatment of the body in response to a control signal; and
battery monitoring means for periodically detecting the energy of the battery means just prior in time to the periodic treatment of the body and for providing the control signal for controlling the treatment parameter as a function thereof, the controlled parameter providing an externally recognizable indication of the energy of the battery means.

4,276,884
BRASSIERE

Avis K. O'Daniels, 3801 Marquette Pl., San Diego, Calif. 92106

Filed Sep. 24, 1979, Ser. No. 78,012
Int. Cl.[3] A41C *3/02*
U.S. Cl. 128—510 3 Claims

1. A brassiere which comprises:
two breast-receiving cups in side-by-side relation;
means for frontally attaching together said cups;
a halter-type strap having its opposite ends connected to respective cups, said strap extending over the wearer's shoulders and having a median section spread horizontally across the wearer's back;
a pair of dorsal straps, each strap of said pair being attached laterally to one of said cups and extending horizontally and arcuately into the middle of the wearer's back;
means for attaching the free ends of said dorsal straps together;
at least one pair of tensioning straps adjoining said halter-type strap to said dorsal straps, said tensioning straps having one of its extremities connected to the end of the horizontal median section of the halter-type strap and the other extremity connected to the rear lateral section of one of the dorsal straps; and
said tensioning straps and said halter-type strap are positioned and dimensioned so that said horizontal median section extends generally from the lower end of one of the wearer's shoulder blades to the other, whereby the sections of the halter-type strap rest on top of the area above the lateral ends of the wearer's clavicles.

4,276,885
ULTRASONIC IMAGE ENHANCEMENT

Ernest G. Tickner, Morgan Hill, and Ned S. Rasor, Santa Clara County, both of Calif., assignors to Rasor Associates, Inc, Sunnyvale, Calif.

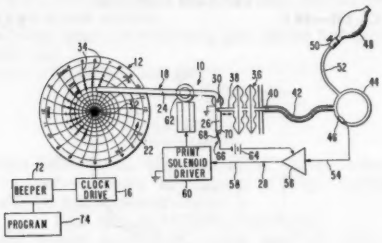
Filed May 4, 1979, Ser. No. 36,098
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—660 15 Claims

1. A method of enhancing ultrasonic echographic imaging in a liquid enclosed in a vessel by increasing image contrast, comprising:
providing a plurality of microbubbles in said liquid, each of said microbubbles having a coalescence resistant surface membrane encapsulating a gas of a selected composition, said membrane including a multiplicity of non-toxic and non-antigenic organic molecules, said microbubbles having a diameter of no more than about 300 microns and no less than about 0.5 micron; and
obtaining an enhanced ultrasonic echographic image of said liquid opposite a position therein containing said microbubbles by increasing the relative contrast between said liquid and said vessel.

4,276,886
BLOOD PRESSURE RECORDER

Alfred E. Sibley, Box 432L, Rte. 1, Boulder Creek, Calif. 95006

Continuation of Ser. No. 842,203, Oct. 14, 1977, abandoned.
This application Aug. 27, 1979, Ser. No. 70,076
Int. Cl.³ A61B 5/04
U.S. Cl. 128—681 5 Claims



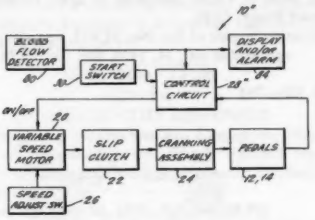
1. In a blood pressure recorder of the type having an inflatable cuff: a record capable of being marked; means mounting the record for movement in one direction; means coupled with the record for moving the same in said one direction; a marking device; first means mounting the marking device in spaced relationship to the record and for movement along a line adjacent to and spaced from the record, said line extending in a second direction transverse to said one direction, said first means permitting the marking device to move into and out of engagement with said record when the marking device is at any of a number of locations along a line extending in said second direction, whereby a dot is market on the record each time the marking device is shifted into engagement with the record as the marking device moves along said line; means coupled with said marking device for moving the same along a line extending in said second direction as a function of cuff pressure; electrically actuated means coupled with the marking device and responsive to Karotkoff sounds for shifting the marking device into and out of engagement with the record a number of times as the marking device moves along a line extending in said second direction, said shifting means including an electronic circuit for actuating said shifting means when the circuit is enabled; and means responsive to fluid pressure in said cuff for enabling said circuit, whereby a line of unconnected dots will be marked on the record at locations along a line extending in said second direction when the marking device is shifted into and out of engagement with the record.

4,276,887
FOOT EXERCISER

Steven R. Hofstein, North Brunswick, N.J., assignor to World Medical Marketing Corporation, New York, N.Y.

Division of Ser. No. 85,330, Oct. 29, 1979. This application Jan. 14, 1980, Ser. No. 111,531
Int. Cl.³ A61B 5/02
U.S. Cl. 128—691 3 Claims

1. A foot exercising device, comprising:
a pair of foot pedals;
motor means for reciprocating said foot pedals;
blood flow detector means for detecting the flow of blood through a leg of a patient using said foot exercising device; and

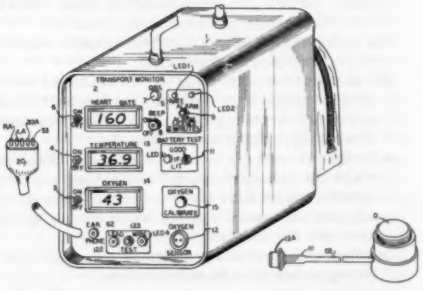


control means connected to said blood flow detector means for controlling the operation of said motor means as a function of said blood flow.

4,276,888
VITAL FUNCTION MONITOR

Charles A. Smith, 46 Hill Rd., Louisville, and Thomas J. Hoehler, 2109 Janlyn Rd., Jeffersontown, both of Ky.

Filed Oct. 26, 1978, Ser. No. 955,108
Int. Cl.³ A61N 5/04
U.S. Cl. 128—706 7 Claims

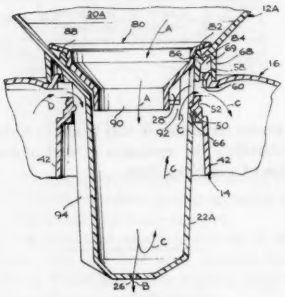


1. A multi-function patient monitor arrangment including patient heartbeat rate monitor means, patient body temperature monitor means, and patient oxygen concentration sensor means, power supply means to supply direct current voltage at positive source voltage V1, first voltage regulator means connected to the output of power supply and having first and second and third output means to supply positive dc voltage V2 where the voltage V2 is less than V1, second voltage regulator having an input connected to an said third output from said first voltage regulator and having first and second voltage regulator output means to supply a voltage V3 which is negative, relative to voltages V1 and V2 wherein said first output of said first voltage regulator means is supplied only to said heartbeat rate monitor means and second output means is supplied to said patient body temperature monitor means and said patient oxygen concentration sensor means and said first output of the second voltage regulator means is selectively supplied to said patient heartbeat rate monitor means and said second second voltage regulator means output is supplied to said patient temperature monitor means and said patient oxygen concentration monitor means.

4,276,889
URINE SPECIMEN COLLECTING DEVICE

David H. Kuntz, Los Angeles, and James A. Ingram, Costa Mesa, both of Calif., assignors to SHS Enterprises, Ltd., Newport Beach, Calif.

Continuation-in-part of Ser. No. 31,427, Apr. 19, 1979. This application Jul. 24, 1979, Ser. No. 60,217
Int. Cl.³ A61B 10/00
U.S. Cl. 128—761 19 Claims



1. A urine specimen collecting device for selectively collecting a mid-stream portion of voided urine, the device comprising in combination:

an integral collector and specimen container, the collector having a first drain exit and a second transfer exit for different portions of the voided urine, the first exit being positioned near the bottom of the collector for bleeding off the first-voided urine, the second exit being positioned above the first exit for transferring urine following the first-voided urine to the specimen container;

the collector including a bleed-off conduit extending between the first and second exits;

the specimen container being toroidally-shaped and configured for releasable mounting on the bleed-off conduit in a position surrounding said conduit for receiving urine flowing through the second exit;

a flexible lid sealingly mounted on the specimen container about the periphery thereof and having a central ring opening spaced from the container to define an opening adjacent the second exit for transferring a specimen of urine into the container; and

overflow means coupled to the specimen container for transferring excess urine from the device.

4,276,890
TOBACCO SMOKING INHIBITOR

Anthony T. Fichera, 319 Palos Verdes Blvd., #310, Redondo Beach, Calif. 90277

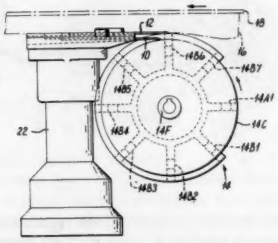
Continuation-in-part of Ser. No. 29,107, Apr. 11, 1979, abandoned. This application Oct. 9, 1979, Ser. No. 82,987
Int. Cl.³ A61K 9/68
U.S. Cl. 131—270 10 Claims

1. A method of inhibiting tobacco smoking of smokers without physiological symptoms of nicotine withdrawal comprising smoking while awake during the waking hours of the day and administering to such a smoker 500 mg to 1500 mg total daily dose of ethyl maltol or maltol as a gamma pyrone divided into several incremental doses during the waking hours of the day, each incremental dose being retained in the smoker's mouth and released therein over a period of at least 10 minutes, for at least about 5 to 10 days, for a total of about 20 to 30 days or at least until there results either of a gradual decrease in the number of cigarettes smoked and the length of time they are smoked or until such point as the lowered tobacco consumption rate becomes obvious.

4,276,891
TRIMMING DEVICES FOR CIGARETTE-MAKING MACHINES

Derek H. Dyett, and Jan A. Rakowicz, both of London, England, assignors to Molins Limited, London, England

Filed Oct. 27, 1978, Ser. No. 955,225
Claims priority, application United Kingdom, Oct. 27, 1977, 44673/77
Int. Cl.³ A24B 5/18, 5/30
U.S. Cl. 131—84 C 9 Claims

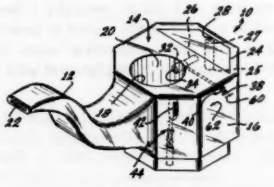


1. A trimming device for trimming cigarette filler stream in a cigarette making machine comprising a first fixed blade and a first rotating brush member which cooperate to remove from the tobacco stream tobacco lying further than a first predetermined distance from the tobacco conveyor; a second fixed blade and a second rotating brush member which cooperate to remove tobacco at regular spaced intervals corresponding to portions of the stream forming intermediate sections of the filler for each finished cigarette, the second blade being set at a second predetermined distance from the tobacco conveyor which is smaller than the first predetermined distance.

4,276,892
SMOKING DEVICE WITH SELF CONTAINED LIGHTING APPARATUS

Joseph Iaquinta, 540 Rancho Ter., Escondido, Calif. 92025

Filed Nov. 6, 1979, Ser. No. 91,795
Int. Cl.³ A24F 47/00
U.S. Cl. 131—185 12 Claims



1. A smoking device with an improved self-lighting apparatus in combination therewith, said smoking device having an enlarged end structure with a hollow bowl therein for containing a substance to be smoked and a hollow stem attached thereto and communicating with said hollow bowl, said stem having a bit receiving end portion, said apparatus comprising:

a supply of pressurized fuel positioned within said enlarged structure;

a first fixedly positioned fuel delivery tube extending from said supply of pressurized fuel to a position adjacent said hollow bowl and terminating within said enlarged structure;

a second translatable fuel delivery tube engaging a portion of said first fuel delivery tube in a telescoping manner for selectively extending the length of said first fuel delivery tube, said first and second fuel delivery tubes comprise a

fuel control valve, said second translatable fuel delivery tube is translatable with respect to said first fuel delivery tube between a first position wherein it is contained within said enlarged structure to a second position wherein it extends into said hollow bowl, said fuel control valve shutting off the supply of fuel through said delivery tubes when said translatable fuel delivery tube is in said first position and opens allowing fuel to flow through said delivery tubes when said translatable fuel delivery tube is in said second position;

translating means for translating said second fuel delivery tube; and

an ignitor for igniting said fuel.

4,276,893

COMPACT

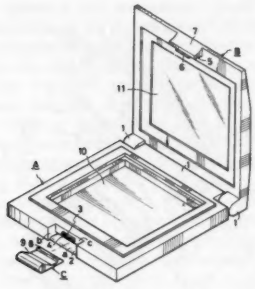
Seikichiro Enomoto, 40, Arisugawa machi, Sagano, Sakyo-ku, Kyoto, and Yoshiharu Hatakeyama, 5-29-10, Tachibana, Sumida-ku, Tokyo, both of Japan

Filed May 31, 1979, Ser. No. 44,222

Claims priority, application Japan, Apr. 20, 1979, 54-52020[U]

Int. Cl.³ A45D *33/00*

U.S. Cl. 132—83 R **2 Claims**



1. A compact comprising:

a case body (A) having tray means (10) therein for holding a substance;

a lid body (B);

hinge means (1) for interconnecting like edges of said case body and said lid body for pivotable movement between open and closed positions;

a box like dent (2) formed in an edge of said case body opposite the edge of said case body connected to said hinge means, said dent having a base (a), side walls (b) extending upwardly from the base and inwardly from the case body edge, and an inner wall (c) extending upwardly from the base and interconnecting inner edges of the side walls;

first hook means (3) protruding from an upper portion of said inner wall;

a slide hole (4) defined in and extending inwardly from a lower portion of said inner wall with the bottom of the slide hole being in the plane of the base;

latch means protruding downwardly from an edge of said lid body opposite the edge connected to said hinge means, said latch means having an inner surface with second hook means (6) protruding therefrom, said first and said second hook means being mutually engageable with each for releasably holding said case body and said lid body in the closed position, said latch means having an outer edge with a recessed lower portion (7) formed therein; and

a slide member (C) having a leading end inserted into said hole, a lower surface slidable on said base, and an upper surface having a tapered portion extending downwardly from an outer portion to an inner portion of said slide member, said tapered portion being located in the recessed lower portion of said latch means when said first and said second hook means are engaged with each other and being movable into said dent so that a lower portion of said latch means is moved upwardly by said tapered portion to thereby disengage said first and said second hook means from each other.

4,276,894

AUTOMATIC COIN DISPENSER

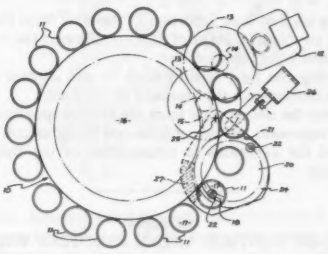
Joseph R. Heywood, 118 Morgan St., Kingsgrove, New South Wales, Australia, assignor to Joseph Richard Heywood, Kingsgrove and Leonard Hastings Ainsworth, Roseberry, both of, Australia

Filed May 23, 1979, Ser. No. 41,773

Claims priority, application Australia, Oct. 24, 1978, PD6518

Int. Cl.³ G07D *1/00*

U.S. Cl. 133—5 R **3 Claims**



1. An automatic coin dispenser comprising a plurality of coin holding tubes of equal length mounted in a circle on a rotatable base, means at the lower end of each tube to support a column of coins in the tube, rotatable coin ejecting means constructed and arranged when activated to eject coins from the bottoms of a sequence of columns of coins during rotation of said base, means to activate or deactivate said coin ejecting means, means to rotate the base, means to collect coins ejected, means to remove from said columns of coins, coins projecting above the tops of said tubes as the base rotates and means to receive coins so removed, and wherein the coin ejecting means comprises a member rotated in synchronism with said base beneath the said tubes, at least one coin ejecting member on said rotated member, said at least one coin ejecting member being movable to and from an activated position in which during rotation it makes contact through an aperture in each said tube with the bottom coin of each passing column to eject that coin from its tube and to and from a deactivated position in which no contact is made with coins, said means to activate or deactivate said coin ejecting means comprising cam means movable to and from an activated position in which each coin ejecting member is caused by said cam means to assume an activated position during rotation beneath said tubes.

4,276,895

APPARATUS AND METHOD FOR TEMPERATURE COMPENSATION OF FLUIDIC CIRCUITS

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 20, 1979, Ser. No. 77,442

Int. Cl.³ F15C *1/14*

U.S. Cl. 137—2 **8 Claims**

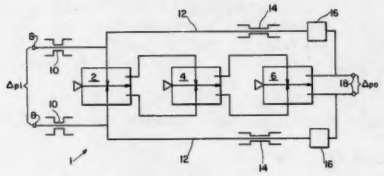
8. In a fluidic circuit comprising at least one fluidic element having dual outputs for fluid flow, a method for compensating said circuit for changes in gain due to variations in temperature of the fluid in said circuit, said method comprising,

directing the fluid flow from said outputs of said circuit to

respective dual control inputs of a fluid proportional amplifier,

regulating the flow through said control inputs in accordance with the density of the fluid flowing therethrough,

controlling the output of said fluid proportional amplifier in response to the flow through said control inputs and directing the output of said amplifier through two output paths,



feeding back at least a portion of the flow from the respective two output paths of said amplifier to the respective control inputs thereof, and

regulating the flow feeding back to said control inputs in accordance with the viscosity of the fluid,

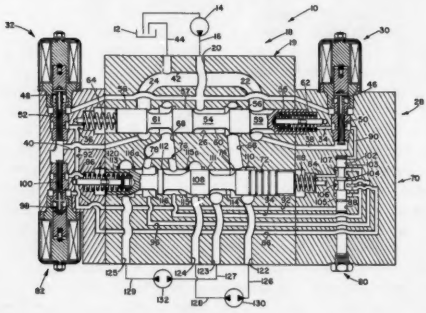
whereby the output flow from the fluid proportional amplifier represents the output from said fluidic circuit compensated for variations in temperature of the fluid in the circuit.

4,276,896

FLOW CONTROL VALVE ASSEMBLY WITH INTEGRATED TORQUE AND FLOW DIVIDER CONTROL

Billie G. Hunck, Cedar Falls, and Robert W. Nelson, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 5, 1979, Ser. No. 91,101
Int. Cl.³ F15B *13/06*
U.S. Cl. 137—101 **11 Claims**



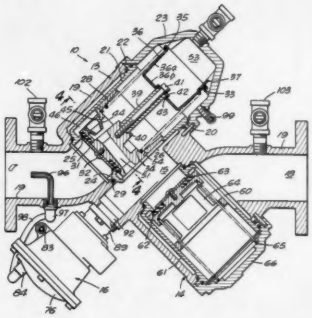
1. A flow control valve comprising: a valve body having a bore provided therein having a first and a second closed end; said valve body having first and second pilot passages provided therein respectively connected to the first and second closed ends of the bore; said valve body having first, second, and third ports provided therein spaced apart and connected to the bore; said valve body having a first function passage provided therein fluidly connected to the first port; said valve body having second, third, and fourth function passages provided therein spaced apart and connected to the bore proximate the first function passage; said valve body having first and second sensing passages provided therein respectively fluidly connected to the second and third ports; control means disposed in the valve body connected to the second pilot passage for selectively relieving fluid pressure in the second closed end of the bore; spool means disposed in the bore blocking the first closed end thereof from the second closed end and slidable between a first and a second position; said spool means having groove means provided therein for metering the flow of fluid between the second port and the third function passage and between the third port and the fourth function passage in the first position, and for connecting the second function passage to the third function passage and the second and third ports to the fourth function passage in the second position; said spool means including land means for blocking the second function passage from the third function passage and the second port from the third port in the first position and for blocking the first port from the second function passage and the second port from the third function passage in the second position; and direction sensing valve means provided in the valve body for fluidly connecting the first and second sensing passages to the first and second pilot passages, respectively.

4,276,897

BACKFLOW PREVENTION APPARATUS

David E. Griswold, Corona Del Mar, Calif., assignor to Griswold Controls, Irvine, Calif.

Continuation of Ser. No. 918,646, Jun. 23, 1978, abandoned.
This application Feb. 13, 1980, Ser. No. 121,156
Int. Cl.³ F16K *17/02*
U.S. Cl. 137—218 **17 Claims**



2. In backflow prevention apparatus for installation between a supply pipe and a discharge pipe, the apparatus including upstream and downstream check valve assemblies with a zone between them, and a relief valve device for venting the zone to atmosphere under predetermined pressure conditions in the pipes, the improvement comprising, in combination: an inlet passage from the supply pipe terminating in a stationary valve seat forming a part of the upstream check valve assembly, a stationary barrel positioned coaxially of said valve seat, a valve poppet guided for movement in said barrel toward and away from said valve seat, a spring acting to move said valve poppet into sealing contact with said valve seat, said spring acting to create a pressure drop through the upstream check valve assembly when said valve poppet is initially moved away from said seat by fluid pressure in said inlet passage, means cooperating with said barrel and said valve poppet to define a spring chamber remote from said valve seat and enclosing said spring, an ejector nozzle on said valve poppet receiving fluid from said barrel when said valve poppet has separated from said valve seat, said ejector nozzle having a discharge end communicating with said spring chamber so that relatively rapid fluid flow from said ejector nozzle causes a reduction in fluid pressure in said spring chamber to oppose the action of said spring and thereby reduce the pressure drop across the upstream check valve assembly.

11. In backflow prevention apparatus for installation between a supply pipe and a discharge pipe, the apparatus including upstream and downwstream check valve assemblies with a zone between them, and a relief valve device for venting the

zone to atmosphere under predetermined pressure conditions in the pipes, the improvement comprising, in combination: an inlet passage from the supply pipe terminating in a stationary valve seat forming a part of the upstream check valve assembly, a valve poppet guided for movement toward and away from said valve seat, a first spring acting to move said valve poppet into sealing contact with said valve seat, said first spring acting to create a pressure drop through the upstream check valve assembly when said valve poppet is initially moved away from said seat by fluid pressure in said inlet passage, means cooperating with said valve poppet to define a chamber remote from said valve seat, aspirator means on said valve poppet receiving fluid when said valve poppet has separated from said valve seat, and acting to cause a reduction in fluid pressure in said chamber to oppose the action of said first spring and thereby reduce the pressure drop across the upstream check valve assembly, said relief valve device having a movable valve element cooperating with a stationary seat for controlling flow to atmosphere from said zone, a second spring acting to cause said movable valve element to move toward open position, and differential pressure means sensitive to pressure in said inlet passage and in said aspirated chamber for changing the effective force of said second spring.

12. In backflow prevention apparatus for installation between the supply pipe and the discharge pipe, the apparatus including upstream and downstream check valve assemblies with a zone between them, and a relief device for venting the zone to atmopshere under predetermined pressure conditions in the pipe, the improvement comprising, in combination: an inlet passage from the supply pipe leading to the upstream check valve assembly, said upstream check valve assembly having a chamber aspirated by fluid flow through said upstream check valve assembly, said relief valve device having a movable valve element cooperating with a stationary seat for controlling flow from said zone to atmosphere, said movable valve element including a stem, a body enclosing said stem and having a cover, a plate having a spherical hub portion fixed to said stem, a first flexible diaphragm engaging said plate and having an outer periphery clamped between the cover and the body to form a first expansible space, a second flexible diaphragm extending between the stem and the body, a self-aligned member mounted on said spherical hub portion of said plate, a spring operatively positioned between said member and said body and acting to move said movable valve element away from said stationary seat, means for connecting said first expansible space to said inlet passage, and means for connecting the space within the body and between said diaphragms to said aspirated chamber.

4,276,898

DELIVERY SYSTEM FOR PNEUMATIC VESSELS

Peter Ross, New York, N.Y., assignor to Stop-A-Flat Corporation, Huntingdon Valley, Pa.

Filed Jan. 30, 1980, Ser. No. 117,008
Int. Cl.³ F16K *15/20, 51/00*
U.S. Cl. 137—231 **15 Claims**

1. In a delivery system including a pump for pumping a treatment fluid into the interior of a pneumatic vessel under pressure through the valve thereof wherein the valve includes a valve stem and a valve core, the combination of

a one way valve housing, said one way valve housing being in fluid communication with the pump and the vessel to permit flow of the treatment fluid toward the vessel when the pump is activated,

the one way valve housing including a first seal to prevent loss of vessel pressure,

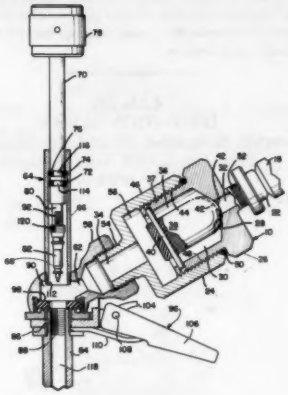
the first seal comprising a valve seat, a resilient plug and means to normally bias the plug against the seat to close the one way valve housing; and

an extractor assembly fitting means, said one way valve housing being securely engaged to said extractor fitting means,

a valve core extractor assembly means in fluid communication with the one way valve housing,

the valve core extractor assembly means comprising a valve core extractor means to remove the valve core and a second seal to prevent loss of vessel pressure when the valve stem is removed,

the valve core extractor assembly means and the one way



valve housing being in fluid communication with the pressurized interior of the pneumatic vessel when the valve stem is removed,

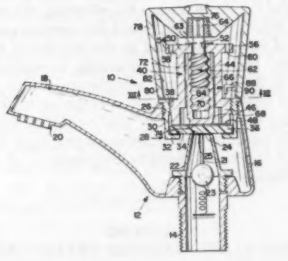
the valve core extractor means being adapted to remove or replace the valve core within a pressurized atmosphere without loss of pressure and said valve core extractor assembly means being securely engaged to said extractor fitting means.

4,276,899

FAUCETS

Brian A. C. Kirk-Duncan, The Rectory, St. Mary at Hill, London, EC3R 8EE, England

Filed Feb. 15, 1979, Ser. No. 12,420
Int. Cl.³ F16K *15/18, 7/16, 43/00*
U.S. Cl. 137—327 **10 Claims**



1. A faucet for controlling liquid flow comprising a housing, wall means in said housing defining an orifice through which liquid is to flow, a substantially flat sealing member overlying said orifice, a support surface for the periphery of said sealing member, said surface being provided by a radially inwardly extending flange coaxial with said orifice, clamping means for holding the periphery of said sealing member into sealing contact with said support surface, pressure applying means selectively operable to apply pressure to the other face of said sealing member to force said one face into sealing contact with

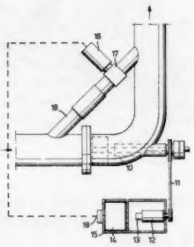
said orifice, and a handle adapted to operate said pressure applying means, said pressure applying means including a piston slidably mounted in said housing and having guide means co-operating with said housing to prevent rotation of said piston relative to said housing and a spindle rotatably mounted in said housing and connected to said handle for rotational movement therewith, said spindle having a threaded portion engaging a complementary threaded portion provided on said piston whereby rotation of said spindle by said handle includes sliding movement of said piston relative to said housing to control movement of said sealing member and regulate flow through said orifice.

4,276,900

IRRIGATION DEVICE

Lars Rosenqvist, Gringelstad, 290 24 Gärds-Köpinge, Sweden

Filed Aug. 2, 1979, Ser. No. 63,083
Int. Cl.³ B05B 3/18
U.S. Cl. 137—355.21 **2 Claims**



1. An irrigation device comprising a hose which is adapted to be connected at one end to a variable water supply means and at the other end to a spraying device, a drum which is rotatable to coil said hose during an irrigation process, a turbine in communication with said water supply means and adapted to rotate said drum to coil up said hose at a speed dependent upon the pressure of water passing from the supply means to said hose, a bypass pipe including a flow control valve such that a portion of said water from said water supply means to said turbine bypasses said turbine through said control valve, means for sensing said speed at which said hose is being coiled onto the drum and producing a corresponding electrical signal, means for comparing said electrical signal with a preset reference signal corresponding to a desired speed of rotation of the drum, means for adjusting the speed of rotation of the drum comprising means for opening and closing the flow control valve comprising an electric motor and a generator therefor, said generator operably connected with said turbine to be driven thereby, said electric motor opening and closing said flow control valve in response to the difference between said signals, whereby said electrical signal becomes substantially equal to said reference signal such that the rotation of said drum substantially corresponds to said desired speed of rotation.

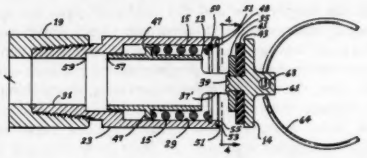
4,276,901

HIGH FLOW PRESSURE RELIEF VALVE

Jerry L. Lyons, St. Louis County, Mo., assignor to Essex Cryogenics of Missouri Inc., St. Louis, Mo.

Filed Sep. 27, 1979, Ser. No. 79,378
Int. Cl.³ F16K 17/20
U.S. Cl. 137—469 **7 Claims**

1. A gas pressure relief valve for automatic venting of a high pressure source to an area of lower pressure with high volumetric flow in response to pressure build-up of said source, said valve comprising a valve body, an elongated recess in said body, a passage connecting one end of said recess with said source for receiving fluid flow therefrom through said recess toward the opposite end thereof, a poppet element fitted in said recess other end and adapted for normally closing said other end, said poppet element including a tubular sleeve fitted axially and slidably within said recess, said sleeve opening at one end into said passage, a closure extending across the other end of said sleeve and configured for providing a gas-tight sealing engagement with said valve body at said opposite end of said recess, said sleeve defining a second passage having a transverse cross-sectional area at least as great as that of the first said passage, said second passage being of substantially constant diameter and forming with said first passage a flow path through said valve substantially devoid of any constriction productive of a vena contracta within said flow path, said sleeve having at least one gas release port providing a cross-sectional area at least as great as the transverse cross-sectional area of said second passage, said port being proximate said closure, means for resiliently urging said poppet element toward said one end of said recess defining a valve seat for maintaining said gas-tight sealing engagement, said valve body terminating substantially commensurate with said valve seat, thereby to avoid extending beyond said poppet any fluid flow restrictive structure, said poppet element being axially movable away from said valve seat of said recess in response to a



predetermined value of gas pressure differential between said source and area of lower pressure for opening said port to said area of lower pressure, said sleeve effectively defining a nozzle for maintaining a constant dynamic pressure upon said closure upon movement of said poppet element away from said valve seat, said poppet element upon said movement introducing into said flow path no constriction productive of a vena contracta within said flow path, the extent of opening of said port being dependent upon the differential in gas pressure between said source and lower pressure area, said poppet being maintained in a position opening of said port by the dynamic impact of a gaseous stream flowing through said second pressure against said closure, and whereby said gaseous stream during flow along said flow path exhibits substantially no divergence within said valve, said closure being flanged, said closure including an area of sealing engagement with said valve body having a sealed diameter which is less than the effective diameter of said flanged closure, said flanged closure extending across said gaseous stream during said flow, said impact of said gaseous stream upon said flanged closure thereby preventing said closing engagement with said valve body until said gas pressure differential is less than said predetermined valve.

4,276,902

MODULAR FLUID PRESSURE REGULATOR VALVES

Verlon C. Roth, Pasadena, Calif., assignor to RK Industries, Ontario, Calif.

Filed Nov. 5, 1979, Ser. No. 90,907
Int. Cl.³ F16K 31/12
U.S. Cl. 137—505.18 **3 Claims**

1. A fluid pressure regulator valve combination comprising:
a rigid plastic composition valve housing having coaxial aligned opposed inlet port and outlet port, and a hollow cylindrical interior having four stepped concentric cylindrical bores, said concentric bores comprising a deep base bore, a fluid transfer bore disposed above said deep base bore, an outlet base bore disposed above said transfer bore, and a screw cap retainer bore having internal screw threads disposed above said outlet base bore, each one of

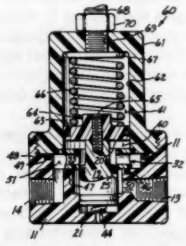
the stacked aforesaid concentric bores having a successively larger selected bore diameter on serially proceeding from said deep base bore to said screw cap retainer bore;

a cylindrical sealing solid piston having a first flat piston crown end face and an opposed second flat piston end face, said second piston end having a larger diameter than said crown face, said piston having one diametrically concentric fluid transfer channel disposed in and circumferentially around the piston cylindrical axis adjacent to said first piston crown end face, said piston having a circumferential shoulder suitable for sealing fluid flow disposed adjacent to said channel;

two sealing O-rings disposed in O-ring sealing channels, each of said O-rings separately concentrically disposed adjacent said second flat piston end face and said circumferential shoulder adjacent to said fluid transfer channel, providing slidable fluid sealants on said piston;

a cylindrical screw cap having a shaped hollow dome and external concentric screw threads secured in said hollow cylindrical valve housing interior, said external screw threads mating with the screw threads of screw cap retainer bore;

an interior fluid distribution annular washer compressively secured and seated between the base of said outlet base bore and a concentric annular washer recess disposed in the interior face of said screw cap adjacent said cap screw threads, said annular washer having multiple concentric radial apertures extending normally from the annular washer symmetry axis, providing a connecting fluid flow



path to a concentric tubular cap bore disposed in said screw cap;

a solid flat slidable sealant piston head diametrically sized to provide a close slidable linear alignment in said screw cap tubular bore, said flat sealant piston head coaxially secured by fastener to said first flat crown end face of said solid piston, said solid flat sealant piston head having an O-ring sealant, providing a fluid transfer seal between a lower fluid cavity in said screw cap bore and an upper cavity in said screw cap bore;

a first actuating means secured in said screw cap adjacent said solid flat piston head and disposed to cooperatively variably actuate said solid flat piston head;

a second actuating means having a compression loaded metal spring biased in an aperture disposed at said second piston end face;

one sealing O-ring disposed in an O-ring channel concentrically disposed in the base of said outlet base bore adjacent to said fluid transfer bore, providing a fluid transfer seal;

one sealing O-ring disposed in an O-ring channel concentrically disposed in the base of said screw cap retainer bore, providing a fluid transfer seal;

a first internal fluid port connecting conductively said inlet port to said fluid transfer bore; and,

a second internal fluid port disposed in said base of said screw cap retainer bore connecting conductively said outlet base bore to said outlet port;

whereby actuating said first actuating means positions said sealant piston head of said piston in an open valve position, providing an open fluid transfer path from inlet port, through said first internal fluid port, through said concentric fluid transfer channel disposed around said piston axis, through said fluid transfer bore, through said outlet base bore, through said second internal fluid port and through said outlet port,

and whereby actuating said second actuating means positions said second piston end face in a selected valve position, positioning said piston in a selected position, regulating the pressure of said fluid flow at a controlled pressure value.

4,276,903

CONTROL VALVE

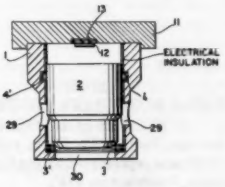
Hanswerner Spohr, Leibreddestr. 1, Witten 7 - Stockum, Fed. Rep. of Germany (5810)

Filed May 16, 1978, Ser. No. 906,676

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723309

Int. Cl.³ F16K *37/00*; H01H *9/06*

U.S. Cl. 137—554 **3 Claims**



1. A valve for controlling fluidic media, comprising valve housing means (1) of electrically conducting material and including a valve cavity and a plurality of fluid passage means in said valve housing means, stationary valve seat means located between said fluid passage means in said valve housing means and including first stationary electrical contact means and means on the inner surface of said cavity electrically insulating said first contact means from said valve housing means, electrically conducting valve plug means (2) axially movable in said valve cavity and having a given axial length, second stationary electrical contact means (4) forming part of said valve housing means and means on the inner surface of said cavity electrically insulating said second contact means from said valve housing means and located on an opposite side of said passage means and spaced from said first stationary electrical contact means at such a distance relative to said given axial length of said electrically conducting valve plug means that an electrical circuit is closed through said first and second electrical contact means directly through said electrically conducting valve plug means (2) when the electrically conducting valve plug means is in a valve closing position resting on said valve seat means, said electrical circuit being opened when said electrically conducting valve plug means moves off said valve seat means, whereby a wire connection to the valve plug means is avoided, and means insulating the valve housing means from said electrical circuit through said valve plug means wherein said valve cover means forms part of said valve housing means, third stationary electrical contact means (12) electrically insulated from said valve cover means and from said valve housing means, and being operatively supported relative to said second electrical contact means (4) in such a position that a further electrical circuit is closed through said stationary second and third electrical contact means and directly through said electrically conducting valve plug means (2) when the latter is in a valve opening position, said third stationary electrical contact means (12) supported in an insulating manner in said valve cover means, said valve cover means with said third staionary electrical contact means therein limiting the maximum open position of the valve plug means.

2. A spool valve for controlling fluidic media, comprising electrically insulated valve housing means (5) made of electri-

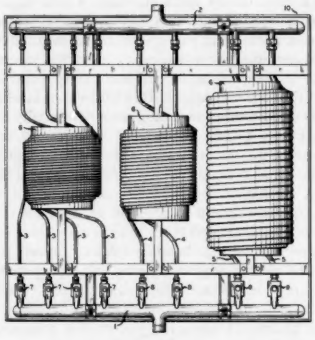
cally non-conductive material, a longitudinal bore through said electrically insulated valve housing means, electrically conducting valve spool means operatively supported for axial movement in said longitudinal bore, said electrically conducting valve spool means comprising a plurality of spool pistons spaced along the valve spool means, said valve housing means comprising a corresponding plurality of fluid passage means positioned to be opened and closed by a respective one of said spool pistons, and stationary electric contact means (6, 7, 8, 9) electrically insulated from and positioned in said valve housing means on both sides of each of said respective fluid passage means, said electrically conducting valve spool means completing, depending on the instantaneous position of said electrically conducting valve spool means relative to the fluid passage means, different electrical circuits directly through a respective piston and a respective set of contact means, whereby a wire connection to the electrically conducting valve spool means is avoided, and whereby various circuits may be closed in various positions of the spool pistons relative to the fluid passages.

4,276,904

ADJUSTABLE FLOW RATE CONTROLLER FOR POLYMER SOLUTIONS

Kenneth M. Jackson, Bartlesville, Okla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 1, 1976, Ser. No. 719,869
Int. Cl.³ G05D *7/00*
U.S. Cl. 137—599 **11 Claims**



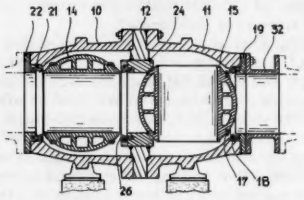
1. An adjustable device suitable for controlling the flow rate of a polymer solution comprising
(1) an inlet manifold having an inlet,
(2) an outlet manifold having an outlet,
(3) a plurality of tubes each connected to the inlet and outlet manifolds so that polymer solution flowing into the inlet manifold can flow through the tubes into the outlet manifold, wherein each tube has an internal diameter that is smaller than the internal diameter of the inlet manifold while being large enough that the viscosity of the polymer solution passing through the tube will not be reduced more than about 25 percent, and
(4) a valve associated with each tube, wherein each said valve is capable of both allowing or preventing flow of polymer solution from the inlet manifold to the outlet manifold through said tube and wherein each said valve when fully opened has an internal diameter that is substantially at least as great as that of the tube with which it is associated.

4,276,905

MECHANISM INCLUDING TWO CUT-OFF DEVICES IN SERIES

Bernard Lourdeaux, Ismier, France, assignor to Neyrpic, Grenoble, France

Filed Mar. 10, 1980, Ser. No. 128,562
Claims priority, application France, Mar. 13, 1979, 79 06321
Int. Cl.³ F16K *5/00*; F03B *1/00*
U.S. Cl. 137—613 **1 Claim**



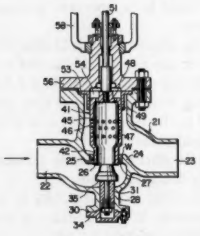
1. A tandem hydraulic valve assembly for use in high pressure and high flow environments such as a high-fall hydroelectric installation, the valve comprising:
a main valve shell, including an upstream shell half and a downstream shell half symmetrically disposed on opposite sides of a transverse medial plane, the respective shell halves having radial flanges at the mutually presented juxtaposed ends thereof;
bolts extending through said flanges and immovably securing the respective shell halves to each other;
a rotatable valve member and an adjacent cooperating valve seat therefor positioned within said upstream shell half;
a rotatable valve member and an adjacent cooperating valve seat therefor positioned within said downstream shell half; and
a journal for each rotatable valve member, the respective journals being supported in their associated shell half for independent rotary movement, and a generally planar plate interposed between said mutually presented juxtaposed ends of the respective shell members and their associated flanges, said bolts extending through said plate and said flanges and immovably securing said plate and said shell halves to each other, and at least one of said adjacent valve seats carried by said plate and cooperating with an adjacent one of said valve members.

4,276,906

SINGLE-SEAT GLOBE CONTROL VALVE

Katsumi Eguchi, 26-16, Kurobaru 2-chome, Kokura-Kita-ku, Kitakyushu City, Fukuoka Prefecture, Japan

Filed Nov. 13, 1978, Ser. No. 959,777
Claims priority, application Japan, Nov. 16, 1977, 52/136683
Int. Cl.³ F16K *47/14, 47/04*
U.S. Cl. 137—625.38 **6 Claims**



1. A single seat globe control valve comprising:
a body having an inlet chest and an outlet chest;

a dividing wall located in said body between said inlet chest and said outlet chest for separating said inlet chest from said outlet chest, said dividing wall having a vertical opening therein for allowing communication between said inlet chest and said outlet chest;

a disk secured to the bottom of said inlet chest and spaced opposite said opening in said dividing wall;

an inverted bottle shaped floating cylinder having a cylindrical hollow chamber and communicating with a cylindrical throat extending downward therefrom, said cylindrical throat being smaller in diameter and volume than said cylindrical hollow chamber, said cylindrical hollow chamber being disposed for upward and downward movement in said outlet chest and having a plurality of small openings in the peripheral walls thereof;

said cylindrical throat having a seat which is adapted for coming in contact with said disc for airtightly sealing therewith, said cylindrical throat being slidably and airtightly fitted in said opening in said dividing wall; and

a stem connected to the top end of said floating cylinder.

4,276,907

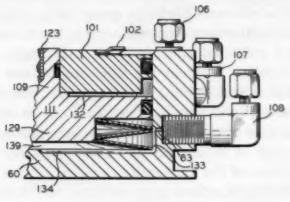
FLUID ACTUATED VALVE

Arthur B. Broerman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 21, 1979, Ser. No. 96,716

Int. Cl.³ F16K *31/143, 31/163, 31/363*

U.S. Cl. 137—637.2 **16 Claims**



1. A multi-port diaphragm-sealed valve comprising:

a piston housing comprising a tubular sidewall and a base portion closing off the lower end of said tubular sidewall portion;

a plunger housing in sealing engagement with said piston housing to close off the upper end of said tubular sidewall, said plunger housing having upper and lower planar faces, a plurality of spaced-apart passageways therein communicating between the upper and the lower faces of said plunger housing, and a plurality of recesses on the upper face of said plunger housing each extending from one of the passageways in said plunger housing to another of the passageways in said plunger housing;

a cap in sealing engagement with the upper face of said plunger housing and covering the passageways in said plunger housing, said cap having upper and lower planar faces and a plurality of spaced-apart passageways therein communicating between the upper and lower faces of said cap, each said passageway being adapted to be positioned above a different one of the recesses in said plunger housing;

a diaphragm positioned between the lower face of said cap and the upper face of said plunger housing, said diaphragm being adapted to cover the recesses in the upper surface of said plunger housing;

a plurality of plunger means each being positioned in and extending through a respective one of the passageways in said plunger housing;

a first piston means having an opening therethrough, said first piston means being positioned in said piston housing between the base thereof and the lower surface of the plunger housing for reciprocal movement along the central axis of said piston housing in sealing engagement with the inner surface of said tubular sidewall, the upper surface of said first piston having such configurtion that a first chamber is formed between the outer portions thereof and the lower surface of said plunger housing;

a second piston means positioned in said piston housing between the base thereof and the lower surface of said first piston means for reciprocal movement along the central axis of said piston housing in sealing engagement with the inner surface of said tubular sidewall, said second piston means having projecting portion which extends upwardly from the main portion of said second piston through said opening in said first piston means and in sealing. engagement therewith for reciprocal movement therein relative to said first piston means, said first and second piston means being of such configuration that when said pistons are brought into abutting relationship, there is a gap between the outer portions of the lower face of said first piston and the outer portions of the upper face of said second piston, said gap defining a second chamber;

first spring means positioned in said first chamber between the lower face of said plunger housing and the upper face of said first piston means to urge said first piston means away from said lower face of said plunger housing;

second spring means positioned in a third chamber defined by the lower face of said second piston means and the base portion of said piston housing to urge said second piston means toward said plunger housing, said second spring means extending from the inner surface of the tubular sidewall to an opening extending through said second spring means;

a stop means extending downwardly from the lower surface of said second piston and through the opening extending through said second spring means, said stop means extending downwardly a distance sufficient to limit the downward movement of said piston;

a first passageway extending through the tubular sidewall of said piston housing and into communication with said first chamber;

a second passageway extending through the tubular sidewall of said piston housing and into communication with said second chamber;

a third passageway extending through the tubular sidewall and into communication with said third chamber;

a groove in the inner surface of the tubular sidewall of said piston housing in communication with said third passageway and extending in said third chamber from the upper surface of the base portion to a point above that where the uppermost portion of said second spring means contacts said tubular sidewall;

a groove in the upper surface of the base portion of said piston housing extending from the groove in the tubular sidewall to a point beneath said stop means;

wherein the lengths of said plunger means and the configurations of said first and second piston means are such that when said second piston means is in its uppermost position and said first piston is in its lowermost position only a first set of said plunger means engages said diaphragm to seal the corresponding spaces between adjacent pairs of recesses, and when said first and second piston means are in their uppermost positions all of said plunger means engage said diaphragm to seal the corresponding spaces between adjacent pairs of recesses, and when said second piston means is in its lowermost position and said first piston is in its uppermost position only a second set of said plunger means engages said diaphragm to seal the corresponding spaces between said adjacent pairs of recesses;

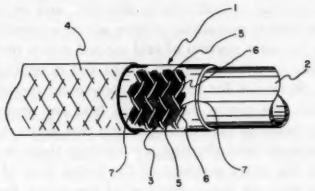
means for releasably securing said cap to said plunger housing; and

means for releasably securing said plunger housing to said piston housing.

4,276,908
BONDED THERMOPLASTIC HOSE

Shek C. Horne, Reading, Pa., assignor to The Polymer Corporation, Reading, Pa.

Continuation of Ser. No. 936,871, Aug. 25, 1978, abandoned.
This application Oct. 24, 1979, Ser. No. 87,730
Int. Cl.[3] F16L *11/08*
U.S. Cl. 138—125 8 Claims



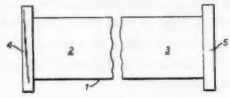
1. A high pressure thermoplastic hose having a compact high coverage reinforcement, characterized in that the reinforcement is a mixed braid made from (1) yarns which intersect and are interwoven with (2) monofilaments or yarns which remain substantially round in cross section when processed in textile machines, whereby stereo interstices are established at the intersection of the (1) yarns and (2) monofilaments or yarns into which interstices is extruded a portion of the adjacent element of the hose.

3. A method for bonding a high coverage reinforcement to another element of a hose characterized in that stereo interstices forming sites for mechanical bonding are established by making a mixed reinforcement layer from a combination of interwoven and intersecting (1) yarns and (2) monofilaments or yarns which remain substantially round in cross section when processed in textile machines.

4,276,909
HEAT-RECOVERABLE WRAP-AROUND DEVICES

Francois Biscop, Strijdersstraat 3, 3200 Kessel-lo, Belgium

Continuation of Ser. No. 971,559, Dec. 20, 1978, abandoned.
This application Jun. 16, 1980, Ser. No. 159,499
Claims priority, application United Kingdom, Dec. 23, 1977, 53704/77
Int. Cl.[3] F16L *11/12, 25/00, 55/16*
U.S. Cl. 138—167 29 Claims

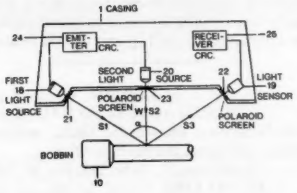


1. A heat-recoverable wrap-around device made from heat-recoverable sheet material, wherein two opposed edge regions of the sheet material which are securable together by a fastening means to form a sleeve prior to recovery are each provided with a strip of relatively rigid material, the strips lying generally in the plane of the heat-recoverable sheet material and having end portions extending beyond the sides of the sheet material which end portions are capable of being engaged with each other and/or one or more other members at or beyond the sides of the heat-recoverable sheet material to form the fastening means thereof.

4,276,910
PHOTOELECTRICAL BOBBIN FEELER

Werner Eichenberger, Zürich, Switzerland, assignor to Gebrüder Loepfe AG, Wetzikon, Switzerland

Filed Feb. 22, 1980, Ser. No. 123,842
Claims priority, application Switzerland, Mar. 15, 1979, 2443/79
Int. Cl.[3] D03D *45/12*
U.S. Cl. 139—273 A 3 Claims

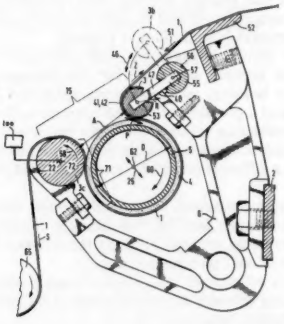


1. A photoelectrical bobbin feeler for monitoring the winding condition of a textile bobbin, comprising a light source, first and second light sensors for receiving light emitted by the light source and reflected specularly and diffusely, respectively, from the bobbin, wherein the light source and light sensors have optical axes defining a scanning plane, the optical axes of the light source and first light sensor form an obtuse angle α, the optical axes of the light source and the second light sensor form an angle β of at least 30°, and a polaroid screen is arranged in front of the light source such as to pass light components oscillating in a plane perpendicular to the scanning plane.

4,276,911
TAKE-OFF APPARATUS FOR THE FABRIC WEB OF A TEXTILE MACHINE, ESPECIALLY A LOOM

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 2, 1979, Ser. No. 90,694
Claims priority, application Switzerland, Dec. 5, 1978, 12385/78
Int. Cl.[3] D03D *49/20*
U.S. Cl. 139—308 11 Claims



1. A take-off apparatus for the cloth web of a textile machine, especially a loom, comprising:

a driven cloth take-off roll;

a respective deflection element, one of which is arranged

forwardly and the other of which is arranged after the take-off roll with respect to the direction of travel of the cloth;

said deflection elements serving for the deflection of the cloth and bearing against the take-off roll while the cloth is interposed therebetween;

means for mounting said deflection elements;

means for movably mounting said cloth take-off roll for movement transversely with respect to its lengthwise axis;

said deflection elements being arranged relative to one another and with respect to the cloth take-off roll such that inner spacing of both deflection elements from one another is smaller than the diameter of the cloth take-off roll;

the deflection element arranged forwardly of the cloth take-off roll being structured as a spreader device for the cloth;

said forwardly arranged deflection element comprising a rod member having two halves; and

said two halves having opposite pitch threaded grooves defining said spreader grooves.

4,276,912

WEFT THREAD CONTROL DEVICE FOR A WEAVING LOOM WITH REMOVAL OF THE WEFT THREAD FROM A SUPPLY SPOOL BESIDE THE LOOM

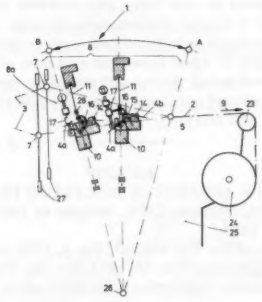
Karel Pejchal; Hans G. Fritzon, both of Ulricehamn, and Raimo Lindström, Västra Frölunda, all of Sweden, assignors to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Aug. 22, 1979, Ser. No. 68,547

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836715; Mar. 30, 1979, 2912728

Int. Cl.³ D03D *47/24*

U.S. Cl. 139—437 **11 Claims**



1. A weft thread control device for a loom having a supply spool from which weft thread is drawn, an insertion element having a thread engaging element and which is movable along a defined path to carry thread drawn off of the supply spool through the shed of warp threads, a batten movable substantially transversely to said path between a pair of reversal positions at each of which the batten reverses its direction of motion and at one of which it engages the last-placed weft thread to beat up the same, and a movable thread guide element by which thead drawn off of the supply spool is presented to said thread engaging element as the insertion element enters the shed and is held clear of the thread engaging element as the insertion element moves out of the shed, said weft thread control device being characterized by:

A. a member by which said thread guide element is carried;

B. means mounting said member on the batten for bodily movement therewith and for limited movement relative thereto between

(1) a first position of said member wherein the thread guide element is so located that thread drawn off of the supply spool extends across said path and

(2) a second position of said member wherein the thread guide element is located to dispose said thread clear of said path; and

C. means connected with said member for yieldingly resisting its movement with the batten during reversal of the direction of motion of the batten, so that said member is moved from one to the other of its said positions in consequence of each movement of the batten through a reversal position.

4,276,913

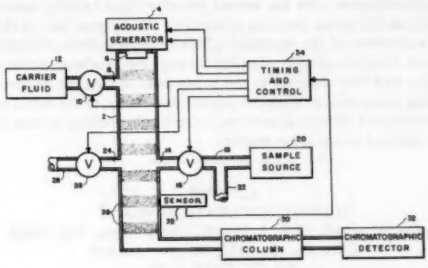
METHOD AND APPARATUS FOR FLUID SAMPLE INJECTION FOR FLUID CHROMATOGRAPHY

Eugene L. Szonntagh, Flourtown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 4, 1979, Ser. No. 81,629

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—1 **18 Claims**



6. A method of injecting a fluid sample comprising the steps of producing an acoustic standing wave in a closed chamber, introducing a fluid sample between two adjacent nodes of the standing waves, trapping the fluid sample between the nodes and ejecting the trapped fluid sample from the chamber.

4,276,914

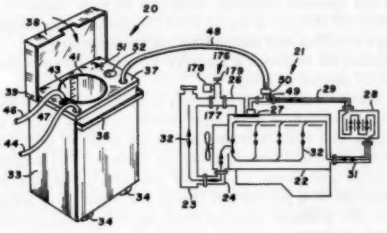
CLEANING APPARATUS AND METHOD

Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391

Filed May 22, 1978, Ser. No. 908,273

Int. Cl.³ B65B *3/12*; B08B *9/00*

U.S. Cl. 141—92 **56 Claims**



1. An apparatus for cleaning, flushing, and filling a liquid cooling system of an internal combustion engine, said cooling system including an engine block and radiator for accommodating cooling liquid, and means for carrying liquid connected to the block comprising: a portable housing adapted to be moved to a desired location, said housing having a top wall, a pump assembly mounted on the housing below the top wall, said pump assembly having a cylinder and a pump piston located within the cylinder, drive means connected to the pump piston to reciprocate the pump piston in the cylinder,

said drive means being operated in response to air under pressure; a manifold having a first chamber, a second chamber, and a one-way valve allowing liquid to flow in a forward direction from the first chamber to the second chamber, a pump hose connected to the pump assembly and manifold for carrying liquid from the pump assembly to the first chamber of the manifold, an input hose connected to the manifold for receiving liquid from the second chamber and adapted to be connected to the means for carrying liquid connected to the block, a control valve mounted on the top wall connected to the manifold in liquid communication with the first chamber, said control valve having a valving means movable to a flush position, an agitate position, a fill position, and an off position, means for carrying water under pressure to the control valve, said valving means when in the flush position being operable to direct said water under pressure to the manifold, thereby providing water under pressure to the cooling system, a by-pass hose connected to the control valve and manifold in liquid communication with the second chamber, said valving means when in the agitate position connecting the by-pass hose to the first chamber of the manifold whereby reverse flow of liquid moves from the second chamber through by-pass hose, control valve, and first chamber to the pump hose so that the reciprocating pump piston causes sequential movement of the liquid in forward and reverse directions in the liquid cooling system of the internal combustion engine.

4,276,915

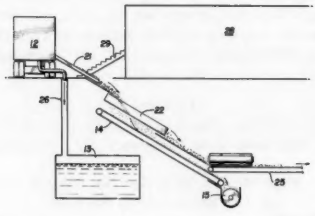
SLUDGE SEPARATION PLANT

Marion H. Argyll, 15 E. Irving St., Chevy Chase, Md. 20015

Filed Jan. 24, 1980, Ser. No. 114,834

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—98 **1 Claim**



1. For use with a truck which converts sludge and effluent into a dry granular material forming a base for fertilizer and concentrated effluent in liquid form for making urea fertilizer, a sludge handling and distribution plant comprising:

(a) means for receiving a plurality of truck bodies at a plurality of discharge areas;

(b) means for discharging the dry granular material containing debris into a sieve type shaker arranged over a conveyor belt both of which are on an angle of declination from the truck toward a central collector and conveyor system positioned to receive the non-liquid discharge contents of a plurality of trucks and which will separate the dry granular material from the debris and discharge each separately,

(c) means at each truck discharge area for discharging the concentrated liquid effluent from each vehicle and storing same in underground tanks for further processing into urea fertilizer;

(d) bin storage means positioned to receive the dried granular material from said central collector and conveyor system and bin storing it until it is further processed for conversion into fertilizer, and

(e) bagging and storing means for said granular material, in communication with said bin storage means,

(f) and conveyor means positioned to convey said granular material from said bin storage means to said bagging and storage means.

4,276,916

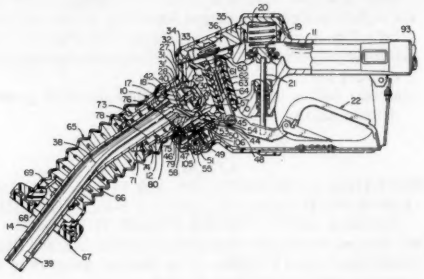
SENSING ARRANGEMENTS FOR SENSING THE PRESENCE OF LIQUID IN A VAPOR LINE

Paul R. Ostand, Cincinnati, Ohio, assignor to Dover Corporation, New York, N.Y.

Filed Jun. 4, 1979, Ser. No. 45,202

Int. Cl.³ B65B *3/18, 57/14*

U.S. Cl. 141—206 **24 Claims**



1. An arrangement for sensing the presence of liquid in a vapor line including a body having an inlet communicating with a source of liquid and vapor and an outlet communicating with an area for receiving vapor, said body having passage means therein connecting said inlet and said outlet, movable means disposed in said body and movable between a first position and a second position, said movable means moving from its first position to its second position when a predetermined quantity of liquid flows into said inlet of said body in a predetermined period of time, and means to sense said movable means in its second position to cause stopping of liquid flow to said inlet of said body.

4,276,917

MOBILE APPARATUS FOR FLUID TRANSFER

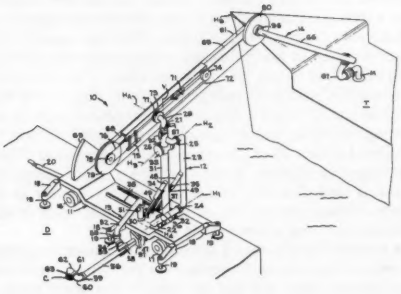
George Fujita, Norwalk, Calif., assignor to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 938,997, Sep. 1, 1978, abandoned. This application Oct. 15, 1979, Ser. No. 85,090

Claims priority, application United Kingdom, Apr. 8, 1978, 13846/78

Int. Cl.³ B65B *3/04;* **F16L** *27/00*

U.S. Cl. 141—387 **16 Claims**



1. An apparatus for establishing a fluid transferring connection between two conduits, said apparatus comprising a mobile platform that travels horizontally to a position adjacent one conduit, a riser assembly mounted upon the mobile platform,

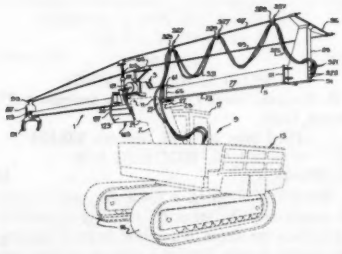
said riser assembly having an upper end and a lower end, a jumper hose assembly having a proximate end coupled to the lower end of the riser assembly and a distal end adapted to be coupled to the one conduit, and a loading arm assembly having a proximate end mounted to the upper end of the riser assembly and a distal end adapted to be coupled to the other conduit, said riser assembly having a rotatable pipe section supporting the loading arm assembly for horizontal rotation about a vertical axis, said riser assembly having a mechanism supporting the rotatable pipe section for swinging movement in a vertical plane between lowered and elevated positions, said mechanism including a parallel linkage having a non-rotatable pipe section that supports the rotatable pipe section for rotation about the vertical axis, a fluid conducting link pivotally connected between the non-rotatable pipe section and a lower portion of the riser assembly, and a support link pivotally connected between the non-rotatable pipe section and the mobile platform, said fluid conducting link and said support link having the same length between pivotal axes at the ends thereof, said pivotal axes extending horiztonally in a direction transversely of the mobile platform, said pivotal axes being laterally spaced by the same distance at the mobile platform and at the non-rotatable pipe section, said mechanism maintaining the vertical orientation of the rotatable pipe section, said riser assembly including a traveling link having an upper end pivotally connected to the support link and a lower end mounted for guided travel along the mobile platform, a guide means mounted on said mobile platform for guiding the lower end of said traveling link, and means for mechanically locking the traveling link in a position where the support link projects upright from the mobile platform, said traveling link providing lateral support for the upright support link.

4,276,918

TREE PROCESSING UNIT

Roger Sigouin, 601, R. 111 West, Amos, Quebec, Canada (J9T 2Y1)

Filed Dec. 6, 1978, Ser. No. 967,050
Claims priority, application Canada, Jun. 22, 1978, 306062
Int. Cl.³ A01G *23/08*
U.S. Cl. 144—2 Z **22 Claims**



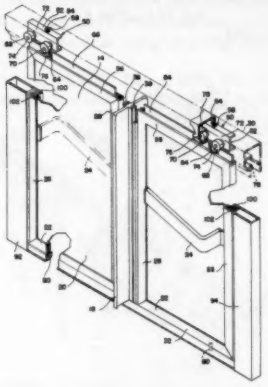
5. A tree processing unit comprising a base member; a boom with a front end and a back end extending through the base member; means for moving the boom through the base member; means on the base member for gripping a tree adjacent its butt end; means fixed on the front end of the boom for gripping and debranching a tree; means fixed on the front end of the boom for cutting the top of the tree; the base member having upper and lower sides and a pair of lateral sides extending between the upper and lower sides; means on the base member adjacent the lower side thereof for detachably connecting the unit to a base support on a motor vehicle which contains hydraulic power means; an upright support at each end of the boom; and at least one tension cable extending between the supports above the boom to strengthen the same; the gripping means on the base member including: a backing member extending down from the lower side of the base member at one lateral side thereof, a jaw member extending down form the lower side of the base member at the other lateral side thereof, and hydraulic means on the base member for moving the jaw member toward the backing member to grip a tree trunk therebetween, said hydraulic means being fed by said hydraulic lines.

4,276,919

ENCLOSURE DOORS

Kenneth I. Walters, Philadelphia, Pa.

Continuation of Ser. No. 807,160, Jun. 16, 1977. This application Dec. 28, 1978, Ser. No. 974,025
Int. Cl.³ E05D *15/26*
U.S. Cl. 160—206 **2 Claims**



1. In an enclosure of the type having an opening defined laterally between right and left jambs and vertically defined between an upper track and a lower track, the combination of

a first door and a second door suspended from said upper track,

each of said doors having respective inward and outward right and left vertical framing members and a vertical medial axis,

said doors being pivotal from a first position wherein the doors position in planar alignment to substantially close the opening to a second, pivotal position wherein the doors are angularly arranged relative to the upper track to expose the opening;

a handle pivotally connecting the first and second doors,

said handle including means adapted to pivotally hold each door to permit each door to pivot relative to the upper track between the said first and second positions,

hanger means connected to each door, part of said hanger means being in sliding relation within the upper track, the hanger means being adapted to slide the doors between the right and left jambs when the doors are pivoted to the said second position, and a pivot pin connected to the bottom of each door, the pivot pin being in sliding relation within the lower track, the pivot pin being in vertical alignment below the hanger means,

said hanger means and pivot pin being laterally offset from the medial axis of its associated door, said hanger means being positioned between a right or left vertical framing member and the medial axis, each door being adapted to pivot about its said hanger means;

magnetic lock means to lock the doors in the first position, said magnetic lock means comprising a movable first magnet means affixed to a movable jamb strip and a second magnet means affixed to a door, said first magnet means being movable to a position to be attracted to the second magnet means when the doors are in the said first position; and

means to laterally adjust the position of the movable jamb strip to vary the size of the opening defined between the said jambs,

whereby the doors when pivoted about the hanger means may be slidable along the tracks to a position adjacent either the right jamb or the left jamb to expose the opening.

4,276,920

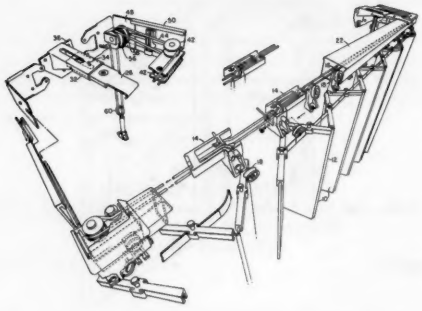
TRAVERSE ROD AND SUPPORT COMBINATION

Paul E. Comeau, Warwick, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.

Continuation-in-part of Ser. No. 23,071, Mar. 23, 1979, and a continuation-in-part of Ser. No. 27,466, Apr. 5, 1979. This application Apr. 25, 1979, Ser. No. 33,161

Int. Cl.³ A47H *5/032*

U.S. Cl. 160—345 **1 Claim**



1. A drapery traverse rod and support combination comprising:

a traverse rod having a slot;

curtain carriers movable in said slot for supporting a curtain;

a draw cord for moving said carriers;

a pulley case at each end of said rod;

a multiplicity of suspension brackets mounted on a wall connected to said rod said brackets located intermediate of the ends of said rod and free of the path of said carriers;

said suspension brackets providing the sole support of said rod on said wall,

means for leading a loop of said draw cord horizontally toward said wall, a pair of adjacent wall pulleys for receiving said loop, means for mounting said wall pulleys to rotate in mutually adjacent relation, a rotatable separating disc between said wall pulleys, and at least one notch in said disc for leading a loop of the draw cord over said wall pulleys.

4,276,921

PROCESS AND APPARATUS FOR THE CONTINUOUS CASTING OF METAL

Alfons E. Lemmens, Herentals, and Hendrik A. L. Gielen, Kasterlee, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Apr. 4, 1979, Ser. No. 26,808

Claims priority, application Luxembourg, Apr. 6, 1978, 79390

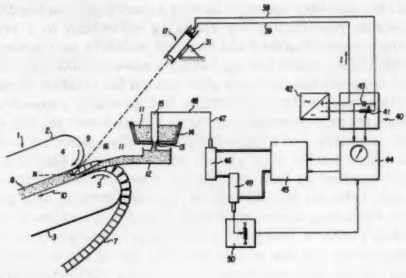
Int. Cl.³ B22D *11/06, 11/16*

U.S. Cl. 164—4 **8 Claims**

1. A process for controlling the casting of metal comprising:

(a) flowing molten metal to an inlet opening of a mold cavity, said mold cavity being formed partially by moving belts including an upper and lower belt and enclosed by a pair of side dams serving as a heat sink to solidify said metal as it traverses said mold cavity to an outlet opening,

(b) exposing a photosensitive element whose range of sensitivity essentially is between 500 and 650 nanometers and only weakly responsive to infra-red radiation by an optical device removed from said cavity to radiation emanating from a zone within said cavity, said zone extending on both sides of a line of demarcation between said molten metal and a surface on one of said side dams not covered by said metal,



(c) generating a signal which varies as a function of the area of said surface not covered by said molten metal whereby said signal is indicative of the level of said molten metal within said zone, and

(d) using said generated signal to control one of the volume of molten metal flowing to said inlet opening and the speed of movement of said moving belts and side dams.

4,276,922

PLUG MOLD ASSEMBLY

Ronald R. Brookes, North Canton, Ohio, assignor to TRW Inc., Cleveland, Ohio

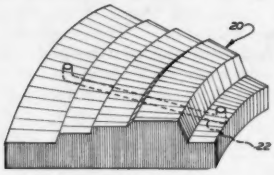
Filed May 24, 1978, Ser. No. 908,804

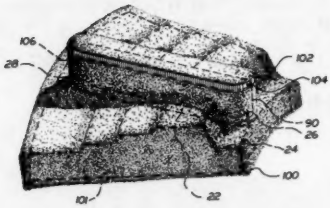
Int. Cl.² B22C *9/10, 9/00*

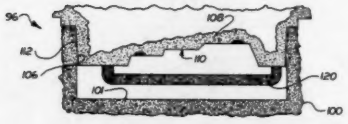
U.S. Cl. 164—27 **12 Claims**

1. A method of forming a mold for use in casting, said method comprising the steps of, forming a positive pattern having a surface the shape of a part to be cast; forming a negative wax partial pattern having a casting surface complimentary to a selected portion of the surface of the positive pattern and a reference surface in a fixed spatial relationship with the casting surface; forming an assembly by accurately positioning the casting surface of the negative wax partial pattern in complimentary engagement with the selected portion of the surface of the positive pattern; forming a first mold section having a surface complimentary to the surface of the part by dipping the assembly formed in the preceding step in a ceramic material; forming a second mold section of ceramic material having a casting surface identical to the casting surface of the negative wax partial pattern and a reference surface identical to the negative wax partial pattern reference surface, the casting and reference surfaces bearing the same spatial relationship to each other as the identical surfaces of the negative wax partial pattern bear to each other; attaching a core to one of the mold sections; and forming a complete mold by placing the refer-

ence surface of the second mold section in abutting engagement with the reference surface of the first mold section







thereby putting the casting surface of the second mold section in registry with the casting surface of the first mold section.

4,276,923

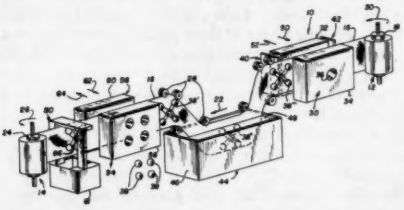
METHOD FOR PRESSURE CASTING METAL OBJECTS

Joseph D. Mislan, 4 Sunset Rd., Lawrenceville, N.J. 08648

Filed Sep. 4, 1979, Ser. No. 71,932

Int. Cl.³ B22D *19/00*

U.S. Cl. 164—76 **20 Claims**



1. A method for pressure casting objects in a metal casting die assembly, said method comprising the steps of:

(a) providing carrier means including a flexible material,

(b) providing a metal casting die assembly including a pair of pressure forming die sections having an open position and a closed, operative position,

(c) said die sections defining a pressure forming die cavity when the die sections are in the closed, operative position,

(d) placing the flexible material between the die sections with the material projecting outwardly from the die assembly when the dies are in the open position, then

(e) moving the die sections to the closed, operative position to hold the flexible material in place with the closed die sections to enclose the material of the carrier means within the die cavity,

(f) introducing molten metal under pressure into the enclosed die cavity to produce a pressure formed object which integrally includes a portion of the flexible material,

(g) engaging the flexible material projecting outwardly from the die assembly to strip the material away from a die section when the die sections are in the open position, and

(h) removing the pressure formed object together with the integrally included portion of said flexible material from the carrier means.

4,276,924

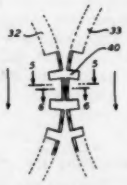
METHOD AND APPARATUS FOR CASTING A SPLAT-COOLED FLEXURE MEMBER

Bo H. G. Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Division of Ser. No. 912,231, Jun. 2, 1978, Pat. No. 4,202,089. This application Oct. 12, 1979, Ser. No. 84,049

Int. Cl.³ B22D *23/00*

U.S. Cl. 164—130 **3 Claims**



1. The method of making high strength metallic glass flexure, comprising the steps of:

heating a metal ingot to form a molten material,

placing a quantity of the molten material between a pair of oppositely facing bearing surfaces with arcuately disposed oppositely facing elongate peripheral protuberances on a pair of rapidly rotating water cooled wheels having peripherally spaced surface portions separated by preformed transverse indentations each time a corresponding pair of oppositely facing bearing surfaces reach their mutual point of near-contact

rapidly cooling said molten material disposed between said pair of oppositely facing bearing surfaces at the point of near-contact upon its contact with said water cooled wheels and forming said molten material into metallic glass flexures by means of said pair of oppositely facing bearing surfaces with protuberances on said wheels.

4,276,925

ELECTRONIC TEMPERATURE CONTROL SYSTEM

Joseph M. Palmieri, Deep River, Conn., assignor to Fuel Computer Corporation of America, New Haven, Conn.

Filed Sep. 19, 1979, Ser. No. 77,105

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—12 **15 Claims**

1. A temperature control system for controlling the ambient temperature at a plurality of locations, respectively, each of which locations is provided with a thermostat, comprising:

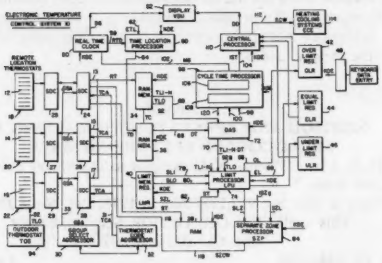
(a) data entry means;

(b) means for polling each of said thermostats to determine the temperature at each said location at a preselected point in real time and to thereby produce polled temperature data;

(c) first memory storage means for storing digital data corresponding to the desired temperature limits for said locations;

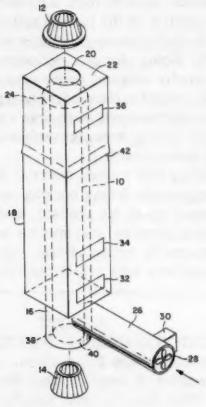
(d) second memory storage means for storing said polled temperature data;

(e) first comparator means for comparing said polled temperature data which said desired temperature limits data and operative to selectively produce over-limit, underlimit and equal limit occurs corresponding to the difference between said polled temperature data and said desired temperature limits data;
(f) third memory storage means for storing said overlimit, underlimit and equal limit counts;



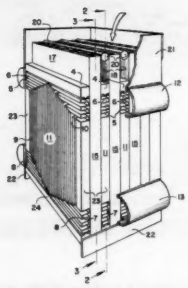
(g) central calculator means operative to alternately, selectively produce temperature changing, and no operation command signals in accordance with said overlimit, underlimit and equal limit counts, and
(h) means for applying said temperature changing signals to a temperature changing source.

4,276,926
STOVE PIPE HEATER
James Evangelow, R.D. #1, Burlington Flats, N.Y. 13315
Filed Aug. 9, 1979, Ser. No. 65,358
Int. Cl.[3] F24B *7/00*; F28D *7/00*
U.S. Cl. 165—39 **6 Claims**



1. A heat transfer apparatus, for cooperation with an associated multistory building, which comprises first and second elongated hollow members, said first elongated hollow member having a circumference which is smaller than the circumference of said second elongated hollow member, said first elongated hollow member having at least an axial portion disposed within said second elongated hollow member, said first elongated hollow member being in fluid communication with an associated combustion chamber on one story of the associated building, and also in fluid communication with the ambient above the associated building, said second elongated hollow member being disposed in fluid communication with an outlet register which is in fluid communication with a story of the associated building higher than the story on which the associated combustion chamber is located, said apparatus further including a third elongated hollow member having a circumference greater than said second elongated hollow member and said third elongated hollow member having at least an axial portion disposed around said second elongated hollow member, said second and third elongated hollow members being in fluid communication at one axial location of each, and said one axial location is at the upper axial extremity of both said second and third elongated hollow members.

4,276,927
PLATE TYPE HEAT EXCHANGER
Harry D. Foust, Dakota, Minn., assignor to The Trane Company, La Crosse, Wis.
Filed Jun. 4, 1979, Ser. No. 45,547
Int. Cl.[3] F28F *3/10, 19/00*
U.S. Cl. 165—70 **7 Claims**



1. A plate type heat exchanger for transferring heat between two fluids of differing temperature comprising
(a) first means for defining a plurality of flow passages through the heat exchanger for one of said fluids, said flow passages being configured in a plurality of generally planar layers;
(b) second means for defining a plurality of flow passages through the heat exchanger for the other of said fluids, said flow passages being configured in a plurality of generally planar layers in alternating relationship with the generally planar layers of flow passages defined by said first means, and which on at least one end, extend substantially beyond the flow passages defined by said first means, said first and second means separating said fluids one from the other in heat exchange relationship;
(c) distribution manifold means for distributing the one of said fluids into the flow passages defined by said first means;
(d) collection manifold means for collecting the one of said fluids exiting the flow passages defined by said first means;
(e) inlet means for channeling the other of said fluids into the flow passages defined by said second means at the one end extending substantially beyond the flow passages defined by said first means; said inlet means including means for sealing the extending ends of the flow passages of adjacent generally planar layers defined by said second means, such that any leak occuring in the extending ends or in said inlet means does not result in the mixing of said fluids, and wherein said sealing means include filler bar means having a rounded surface in contact with the other of said fluids, for reducing flow turbulence in said inlet means; and
(f) outlet means for collecting the other of said fluids exiting the flow passages defined by said second means.

4,276,928

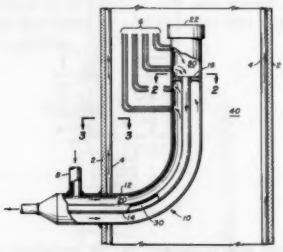
SUPERHEATER INLET/OUTLET HEADER

Henry J. Blaskowski, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 12, 1979, Ser. No. 11,298

Int. Cl.³ F28F *5/00*

U.S. Cl. 165—82 **3 Claims**



1. A heat exchanger of the type for transferring heat between two heat transfer fluids without contact between the two fluids, comprising:

a. a shell;

b. a first plurality of heat exchange tubes lining the interior of the shell thereby defining a chamber within the shell for containing a first heat transfer fluid;

c. an elongated L-shaped outer enclosure having one leg disposed within said shell chamber and the other leg penetrating through and welded directly to the shell;

d. an elongated L-shaped inner tube disposed within said outer enclosure and spaced radially therefrom to provide an annular space therebetween; said inner tube having one leg rigidly connected to one leg of said outer enclosure and the other leg rigidly connected to the other leg of said outer enclosure at a point external of the shell, the interior of said inner tube defining a first flow path through said outer enclosure and said annular space defining a second flow path through said outer enclosure;

e. a second plurality of heat exchange tubes disposed within said shell chamber and interconnected in fluid communication between said annular chamber and said inner tube, said tubes providing a flow passageway for passing the second heat transfer fluid in heat exchange relationship with the first heat exchange fluid such that the temperature of the second heat transfer fluid is higher within said inner tube than within said outer enclosure; and

f. means for passing the second heat transfer fluid first through the plurality of heat exchange tubes lining the interior of the shell, thence through said annular chamber, thence through said second plurality of heat exchange tubes, and thence out of the shell through said inner tube.

4,276,929

HEAT EXCHANGER

Thomas Howard, Lindenhurst, N.Y., assignor to T.J.D. Industries, Ltd., Lindenhurst, N.Y.

Filed Dec. 10, 1979, Ser. No. 101,449

Int. Cl.³ F28F *9/22*; F24H *3/08*; F24B *7/04*

U.S. Cl. 165—145 **9 Claims**

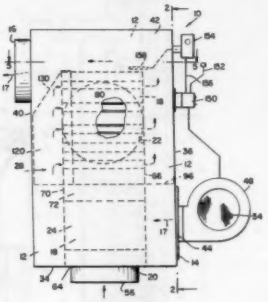
1. A heat exchanger comprising:

(a) an outer chamber having an inlet and an outlet for passing a flow of air through the outer chamber,

(b) an inner chamber disposed within said outer chamber having a second inlet and second outlet for passing a flow of gas through said inner chamber,

(c) heat exchange tubes being arranged in said inner chamber whereby said flow of gas contacts the outer surface of said tubes, and wherein said heat exchange tubes include a first plurality of tubes disposed in a first section of said inner chamber closest to said second inlet, and a second plurality of tubes disposed in a second section of said inner chamber above said first section so that air passes through the heat exchange tubes in the first and second sections for higher heat exchange;

(d) baffle means disposed between said inner and outer chambers for directing said flow of air from said inlet



through said heat exchange tubes wherein said baffle means includes a horizontal plate joined between the inner and outer chambers at the juncture of the first and second sections and extending partially around the inner chamber to form an L-shaped opening whereby the flow of air enters the first plurality of tubes, then into said outer chamber and back into said heat exchange tubes whereby heat is exchanged between the air and gas flows.

4,276,930

TUBE NEST FOR A HEAT EXCHANGER

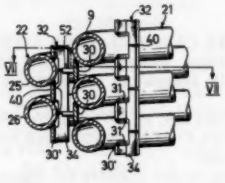
Max Weber, Weisendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 12, 1979, Ser. No. 57,018

Claims priority, application Switzerland, Jul. 12, 1978, 7573/78

Int. Cl.³ F28F *9/00*; F22B *37/20*

U.S. Cl. 165—172 **12 Claims**



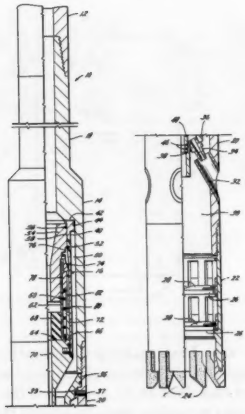
1. A tube group for a heat exchanger comprising a plurality of tubes disposed in approximately horizontal planes and vertical disposition relative to each other; and a plurality of ribs interconnecting said vertically disposed tubes of each tube group and being alternately disposed on opposite sides of a respective tube, each said rib being integrally secured between two vertically disposed tubes eccentrically of each said tube, each rib having an outer face aligned with a corresponding generatrix of said two integrally connected tubes.

4,276,931

JUNK BASKET

William K. Murray, Bossier Parish, La., assignor to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Filed Oct. 25, 1979, Ser. No. 88,188
Int. Cl.³ E21B *3/08*
U.S. Cl. 166—99 **5 Claims**



1. A junk basket comprising
a housing having central bore extending therethrough,
cutting means on the lower end of said housing,
junk retaining means supported within said housing central bore,
a valve assembly mounted within the bore of said housing above said junk retaining means, said valve assembly including
a tubular valve housing positioned in said housing bore,
valve means for controlling flow through said valve housing,
pressure responsive operating means with support means for actuating said valve means whereby said valve means is moved responsive to the stopping and starting of the flow of drilling fluid through said housing between supported open position and unsupported position allowing closing, and
means providing circulation of fluid through said valve housing and said basket housing when said valve means is closed.

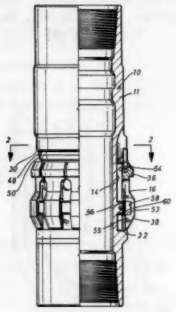
4,276,932

WELL CASING HANGER ASSEMBLY

Kenneth C. Saliger, Houston, Tex., and Martin B. Jansen, Agoura, Calif., assignors to NL Industries, Inc., New York, N.Y.

Filed Oct. 10, 1979, Ser. No. 83,200
Int. Cl.³ F16L *39/00;* E21B *43/10*
U.S. Cl. 166—214 **4 Claims**

1. In a casing hanger assembly for releasably supporting a first tubular member to and from a second member in a well by longitudinal movement of the first member, said first member including an annular recess in its peripheral surface, a radially extending stop shoulder on the first member at each end of the recess, a resiliently expandable and contractible C-shaped spring support ring positioned in the recess and axially slidable thereon between said stop shoulders and locking means on the first member for locking said ring in an expanded position, the improvement comprising,
coacting means on said first member and said support ring allowing longitudinal movement of the support ring relative to the first member but preventing rotational movement of the support ring relative to the first member, and



a fluid flow slot positioned in the periphery of said first member aligned with the split in the C-shaped support ring.

4,276,933

SURFACTANT WATERFLOOD METHOD FOR THE RECOVERY OF OIL

Mohan V. Kudchadker; George Kalfoglou, both of Houston, and Lawrence E. Whittington, Katy, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 900,962, Apr. 28, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 101,598
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—266 **10 Claims**

1. In a method of recovery of oil from a subterranean oil-bearing reservoir traversed by at least one injection well and at least one production well wherein a first aqueous slug containing an anionic surfactant is injected via said injection well and thereafter an aqueous drive agent is injected via said injection well to displace said surfactant slug and said oil through the reservoir to said production well from which production occurs, the improvement comprising the injection via said injection well of a postflush aqueous slug prior to the injection of said drive agent; said postflush containing a nonionic solubilizer selected from the group consisting of alkoxylated alcohols, alkoxylated alkylphenols, and alkoxylated mercaptans wherein the alkyl portion of the said alcohols, alkylphenols and mercaptans have from 9 to 16 carbon atoms and the alkoxylated portion of the said alcohols, alkylphenols and mercaptans have from 1 to 20 ethylene oxide or propylene oxide groups.

4,276,934

METHOD AND DEVICE FOR BLOCKING WELLS TO EXTINGUISH FIRES, PROHIBIT SALTWATER INTRUSION, ETC.

Ward M. Fraser, 23309 Lockness Ave., Harbor City, Calif. 90710

Filed Mar. 6, 1980, Ser. No. 127,585
Int. Cl.³ E21B *33/13*
U.S. Cl. 166—286 **6 Claims**

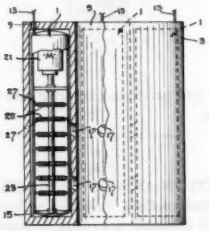
1. A device for plugging wells, when required, comprising:
a plurality of foam generating capsules, each comprising
a series of frangible compartments
a power unit including motor means
mixing means responsive to said motor means such that operation of said motor means causes fracture of the adjacent walls of said frangible compartments and intermixing of the contents of said frangible compartments
foam producing ingredients stored in said frangible compartments so as to be inert before mixing and to actively

generate foam when the contents of adjacent frangible compartments are mixed

a fixture for maintaining said plurality of foam generating capsules disposed in a circular pattern around the centerline of the well comprising

a clear central aperture large enough for a well drill string (not part of the present invention) to pass through, and

a plurality of ports so located and shaped as to direct foam generated by said capsules into said clear central aperture.



4. A method of plugging wells on command comprising:

the placing of a plurality of foam generating capsules, each capable of generating large volumes of foam on command, disposed around the centerline of the well sufficiently displaced from the centerline of the well to allow drilling to continue without interference from said capsules, at a predetermined depth in the well,

the activation of said foam generating capsules, on command, causing foam to be produced and forced into the well hole where it will harden, forming a plug.

4,276,935

TREATMENT OF SUBSURFACE GAS-BEARING FORMATIONS TO REDUCE WATER PRODUCTION THEREFROM

James E. Hessert, and Chester C. Johnston, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1979, Ser. No. 89,421

Int. Cl.³ E21B *33/138, 43/00*

U.S. Cl. 166—295 **16 Claims**

1. A process for reducing the flow of water from a gas producing subsurface formation into the well bore of a gas producing well penetrating said formation, comprising:

injecting a hydrocarbon-diluted polymeric latex concentrate into said formation via said well bore, said hydrocarbon-diluted polymeric latex concentrate comprising a quantity of viscosifying polymer, a quantity of hydrocarbon diluent and a quantity of water, said quantity of water being present in an amount in the range from about 0.01 to about 5.0 percent by weight based on the weight of said hydrocarbon-diluted polymeric latex concentrate; and

allowing said polymeric latex concentrate to be contacted with connate water in said subsurface formation so as to substantially reduce the water permeability of said subsurface formation proximate said well bore while maintaining the gas permeability of said subsurface formation substantially unrestricted.

4,276,936

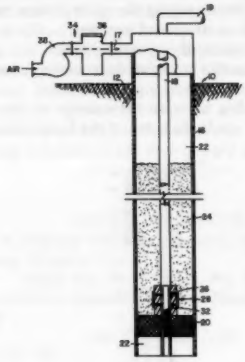
METHOD OF THERMALLY INSULATING A WELLBORE

Howard L. McKinzie, Houston, Tex., assignor to Getty Oil Company, Inc., Houston, Tex.

Filed Oct. 1, 1979, Ser. No. 80,228

Int. Cl.³ E21B *36/00, 43/24*

U.S. Cl. 166—303 **5 Claims**



1. A well operation for a well having a tubing string suspended within a casing string, defining an annulus therebetween, with a packer disposed on the tubing string sealing the tubing-casing annulus above an oil-bearing formation which is penetrated by the well, which comprises the steps of:

filling substantially the entire length of the tubing-casing annulus above the packer with a flowable, solid material having thermal insulating properties introduced in the absence of a carrier liquid to thermally insulate the tubing string; and

fluidizing the solid insulating material for removal from the tubing-casing annulus.

3. A method for thermally insulating a tubing string suspended in a cased wellbore, defining a tubing-casing annulus therebetween, with a packer disposed on the tubing string sealing the tubing-casing annulus above an oil-bearing formation which is penetrated by the well, which comprises the steps of:

entraining a flowable, solid material having thermal insulating properties in a stream of low pressure air;

directing the stream of air entrained material into the tubing-casing annulus; and

filling a portion of the tubing-casing annulus above the packer with the flowable, solid material.

4,276,937

WELL SAFETY SYSTEM

Michael B. Calhoun; Russell I. Eayh, III, both of Carrollton, Tex., and Robert E. Dutton, Aurora, Colo., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 7, 1979, Ser. No. 9,869

Int. Cl.³ E21B *43/12*

U.S. Cl. 166—323 **17 Claims**

1. A surface controlled subsurface safety valve for use in wells, comprising:

(a) an outer housing adapted to be made up as part of a tubing string;

(b) a longitudinal bore through the outer housing, communicating with the bore of the tubing string;

(c) a lateral passageway, intermediate the ends of the outer housing, communicating with the longitudinal bore and the exterior of the outer housing;

(d) a valve closure means disposed within the longitudinal

bore between the lateral passageway and the lower end of the outer housing;

(e) the valve closure means having a first position allowing fluid flow through the longitudinal bore and a second position blocking fluid flow through the longitudinal bore;

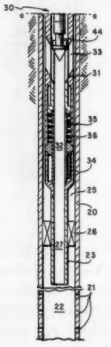
(f) an operating tube slidably disposed within the longitudinal bore to move the valve closure means from the second position to the first position;

(g) means for resiliently urging the valve closure means from its first position to its second position;

(h) means for actuating the operating tube;

(i) means for releasably engaging the actuating means within the upper portion of the longitudinal bore;

(j) means for sealing between the exterior of the actuating means and the inside diameter of the longitudinal bore;



(k) the sealing means preventing communication of fluids from the tubing string above the safety valve with fluids flowing through the valve closure means and the lateral passageway;

(l) first piston means disposed within the actuating means;

(m) means for communicating control fluid pressure from the tubing above the safety valve to one side of the first piston means;

(n) the first piston having a first piston in which the actuating means moves the operating tube to open the valve closure means and a second position in which the resilient urging means can close the valve closure means; and

(o) means for biasing the first piston means to its second position.

4,276,938

METHOD AND APPLIANCE FOR FIRE EXTINGUISHING IN ENCLOSED COMPARTMENT

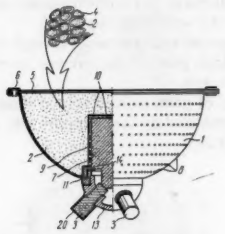
Alexandr S. Klimenko, Leningradskoe shosse, 118, korpus 91; Igor V. Emelyanov, Leningradsky prospekt, 60-A, kv. 137; Anatoly A. Krylov, Eniseiskaya ulitsa, 11, kv. 95, and Semen A. Yantovsky, ulitsa 26 Bakinskikh komissarov, 3, korpus 3, kv. 240, all of Moscow, U.S.S.R.

Filed Nov. 13, 1978, Ser. No. 959,416

Int. Cl.³ A62C *3/02*

U.S. Cl. 169—47 **11 Claims**

1. A method for fire extinguishing in an enclosed compartment by using a chemically active liquid inhibitor as a fire extinguishant; wherein said chemically active inhibitor is confined in miniature capsules made from a thermoplastic material and placed in an individual gas permeable container located in the enclosed compartment and fitted with a fuse extending outside the container and responsive to infrared radiation; said chemically active inhibitor being distributed over the compartment after ignition of the fuse, which acts to change the chemically active inhibitor from a liquid to a gas under the indluence of the temperature rising in the container after ignition of said fuse, destroying the material of the miniature capsules and evaporating the inhibitor whose vapors escape from openings



in the container and produce a noncombustible atmosphere in the compartment.

4,276,939

FIRE DETECTION AND EXTINGUISHING SYSTEMS

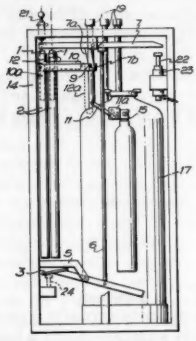
Joseph Atack, Huddersfield, England, assignor to Fire (Waterless Sprinklers) Limited, Guernsey, Channel Islands

Filed May 16, 1979, Ser. No. 45,081

Claims priority, application United Kingdom, May 30, 1978, 24056/78

Int. Cl.³ A62C *37/18*

U.S. Cl. 169—60 **1 Claim**

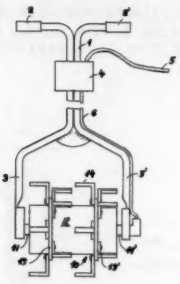


1. Fire detecting and extinguishing apparatus comprising a plurality of individual detectors arranged at respective areas to be protected, each of said detectors emitting an electrical signal of a different frequency from the others when energized by fire, a central receiver having means for receiving each different frequency signal and emitting an electrical switching signal of corresponding frequency, a plurality of switch means each tuned to receive a different one of said switching signals and a solenoid operably connected to each switch means, a plurality of pressurized cylinder assemblies containing fire treatment fluid located in the respective areas, each cylinder assembly having a discharge valve, and means operably connecting each solenoid to the discharge valve of the associated cylinder assembly whereby upon energization of a particular detector a fire treating fluid will be discharged from a cylinder assembly in that area, said last-named means providing a plurality of movably mounted platforms, one at each cylinder assembly, with each of said solenoids operatively connected to displace a different one of said platforms when actuated by the switching signal, and there being a weight on each platform connected to the associated cylinder discharge valve and adapted to fall and open that valve when the associated platform is displaced.

4,276,940
GARDEN IMPLEMENT WITH A DRUM MOTOR

Allan K. Kirkegaard, Nykobing Mors, Denmark, assignor to Anpartsselskab, Nykobing Mors, Denmark

Filed Aug. 20, 1979, Ser. No. 67,910
Claims priority, application Denmark, Aug. 21, 1978, 3692/78
Int. Cl.³ A01B 33/02, 33/08
U.S. Cl. 172—42 6 Claims

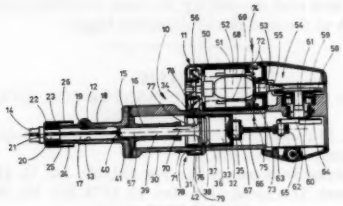


1. A garden implement comprising:
means for defining a frame having spaced apart downwardly extending prongs;
a drum motor having non-rotating protruding shafts carried by said prongs; and
a shell encompassing and rotatably driven by said drum motor, the shell constituting a roller forming a garden implement.

4,276,941
HAND-HELD POWER TOOL

Karl Wanner; Werner Lehmann, and Ulrich Ranger, all of Leinfelden, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 66,007
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844086
Int. Cl.³ B23B 45/02; B25D 11/04, 17/22
U.S. Cl. 173—117 14 Claims

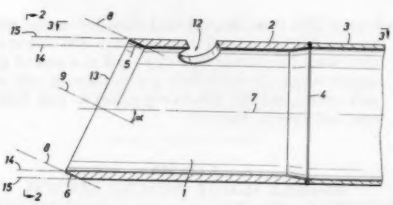


1. A hand-held power tool, comprising a tool holder arranged to hold a tool; a striking mechanism including a cylindrical sleeve having a longitudinal axis, a drive piston axially reciprocable in said cylindrical sleeve, and a striker actuated by said drive piston so as to transmit impact energy to the tool which is held in said tool holder; a drive motor located in axis-parallel relationship with and laterally adjacent to said cylindrical sleeve and having a rotatable shaft with two end portions, one of said end portions extending in a direction opposite to said tool holder and carrying a drive pinion, whereas the other of said end portions extends in a direction toward said tool holder and carries a fan; drive means for converting rotation of said shaft of said drive motor into reciprocal motion of said drive piston of said striking mechanism, said drive means being formed as a one-stage crank drive located rearwardly of said drive piston and having a drive train which extends transversely to said longitudinal axis of said cylindrical sleeve, said crank drive including a bevel gear meshing with said drive pinion of said shaft of said drive motor, a rotatable drive shaft having two end sections, on one of which end sections said bevel gear is mounted for joint rotation therewith, and a crank lever mounted on the other of said end sections of said drive shaft for joint rotation therewith and provided with a crank pin; means for connecting said drive means with said striking mechanism and including a connecting rod articulated with said drive piston of said striking mechanism at a rear side of said drive piston and having a connecting lug which is pivotally connected with said crank pin of said drive means; and means for guiding cooling air so that the latter passes through said drive motor and discharges onto an outer surface of said cylindrical sleeve in the axial region of said striking mechanism and then toward said tool holder.

4,276,942
DEVIATION DEVICE

Kornelis N. Zijlstra, Aberdeen, Scotland, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 15, 1980, Ser. No. 112,262
Claims priority, application United Kingdom, Jan. 19, 1979, 01968/79
Int. Cl.³ E21B 7/08
U.S. Cl. 175—21 8 Claims



1. A deviation device for causing a conductor string to deviate as it is being driven into a subterranean formation, comprising a straight tubular element, open at both ends, wherein the wall of the tubular element at an end part is provided with guide faces, said guide faces being inclined relative to the longitudinal axis of the tubular element and being arranged within the periphery of the tubular element, wherein said guide faces consist of a first guide face at the outer side of the tubular element and a second guide face at the inner side of the tubular element, wherein the wall portion of the tubular element which is provided with the first guide face is arranged diametrically opposite to the wall portion of the tubular element which is provided with the second guide face with each of said first guide face and said second guide face extending substantially one-half way around the tubular element and joint each other in smooth transition.

4,276,943
FLUIDIC PULSER

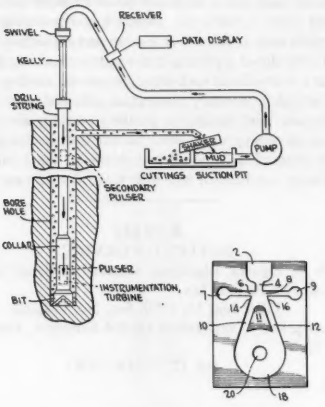
Allen B. Holmes, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 25, 1979, Ser. No. 78,748
Int. Cl.³ E21B 47/12; F15C 1/16
U.S. Cl. 175—40 8 Claims

1. A device for producing pulses in a fluid body comprising,
bi-stable fluid amplifier means for establishing a stable flow of fluid through one outlet thereof, said bi-stable amplifier having dual outlets,
vortex chamber means hving inlets on the periphery thereof and at least one outlet at the center thereof,
said outlets of said bi-stable amplifier means entering said

vortex chamber tangentially in opposite directions through said inlets on the periphery thereof,

and control means associated with said bi-stable amplifier means for selectively diverting the stable flow in one outlet thereof and for establishing stable flow through the other of said dual outlets,



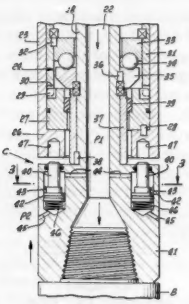
whereby fluid flow through said amplifier means and said vortex chamber means is restricted to a first degree during diversion of the stable fluid flow, and to a second greater degree when the stable flow passes through only one of said outlets, thereby producing pulses in said fluid each time said flow is diverted.

4,276,944

IN-HOLE MOTOR WITH BIT CLUTCH

Bela Geczy, Glendale, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 20, 1979, Ser. No. 67,756
Int. Cl.³ E21B *4/02*
U.S. Cl. 175—102 **9 Claims**



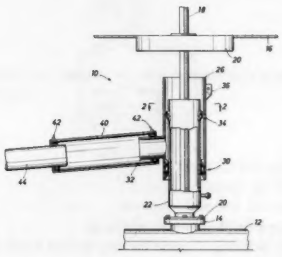
1. An in-hole motor adapted for connection with a rotatable pipe string and a bit, said assembly comprising: a motor stator including a housing structure adapted to be installed in a pipe string; a rotor in said stator; a drive shaft in said housing connected at one end of said shaft with said rotor for rotation therewith and extending from said housing at the other end of said shaft to drive a drill bit; a fluid opening in said shaft having an inlet at said one end of said shaft to conduct fluid from said stator to said other end, a fluid discharge opening at said other end of said shaft and a fluid discharge opening from said housing to the exterior of said housing; a clutch member mounted on said shaft and an other clutch member mounted on said housing springs biasing one of said members towards the other of said members to engage said clutch to couple said housing to said shaft for joint rotation; and fluid operated means to disengage said clutch when fluid pressure in said shaft is in excess of the pressure outside the housing.

4,276,945

MUD RETURN LINE CONNECTOR APPARATUS

Bobby N. Ward, Sr., 11607 Primwood Dr., Houston, Tex. 77070

Filed Jun. 8, 1979, Ser. No. 46,829
Int. Cl.³ E21B *17/02, 21/06;* F16J *15/46;* F16L *17/00*
U.S. Cl. 175—209 **10 Claims**



8. For use above a well during drilling and below the rig floor of a drilling rig which drills the well, wherein the well is drilled with drilling mud which flows back toward the surface where the rig is installed and the mud flow is upwardly through the well, mud handling apparatus which connects with the mud handling equipment therebelow and which comprises:

(a) a detachable, upstanding, mud receiving means having a mud receiving space therein;

(b) an outlet nipple means extending from the mud receiving space and adapted to deliver an outwardly directed flow of mud from the mud receiving space;

(c) a laterally extending mud flow line adapted to deliver a flow of mud to a mud pit; and

(d) telescoping elongate connector means sealingly connecting said mud line and nipple means to define a mud flow path to the mud pits of adjustable length.

4,276,946

BIASED LUBRICANT COMPENSATOR FOR AN EARTH BORING DRILL BIT

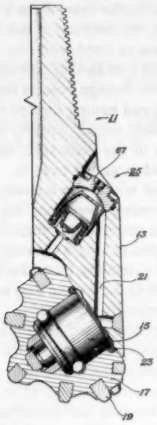
Stuart C. Millsapps, Jr., Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 814,609, Jul. 11, 1977, abandoned. This application Mar. 13, 1978, Ser. No. 885,723
Int. Cl.³ E21B *10/22*
U.S. Cl. 175—228 **12 Claims**

1. In an earth boring drill bit of the type having rotatable cutters mounted on bearing shafts and lubricated by a lubrication system that includes a lubricant reservoir for supplying lubricant to the cutters and a passage extending from the reservoir to the exterior of the bit for the admission of borehole fluid, an improved lubricant compensator comprising:

a flexible cup-shaped diaphragm with sidewalls, a bottom, and a mouth that sealingly surrounds the entrance to the passage; and stiffening means in engagement with a portion of the sidewalls for preventing a portion of the sidewalls from folding, the stiffening means being located intermediate the mouth and bottom, dividing the sidewalls into a folding portion extending from the bottom to the stiffening means and a stiff portion extending from the folding portion to the mouth; the stiffening means being

located so that when the folding portion is fully folded and under no pressure differential, a substantial void space



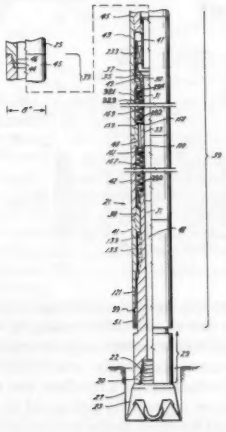
exists in the borehole fluid side of the reservoir between the bottom of the diaphragm and entrance to the passage.

4,276,947

ROLLER BELLEVILLE SPRING DAMPER

James B. Hebel, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed May 14, 1979, Ser. No. 38,790
Int. Cl.³ E21B *17/00*
U.S. Cl. 175—321 **23 Claims**



1. Double acting resilient telescopic unit for use in a drill string to reduce transmission of vibration from the drill bit to the upper drillstring, i.e. that part of the drill string above the drill bit, said unit comprising

a splined sealed tubuler telescopic joint,

variable spring modulus resilient means urging the joint to a zero deflection neutral position with like force upon equal deflection, whether contraction or extension, from neutral position, and

means to contract the length of and thereby equally increase the strain of the resilient means upon equal departures from neutral position upon both extension and contraction of the joint,

said resilient means comprising variable moment arm Belleville springs providing a low spring rate over a working range of travel constituted by positive and negative deflections from said neutral position and a gradually increasing and then sharply increasing spring rate as the limits of both extension and contraction of the joint are approached upon farther positive and negative deflection respectively,

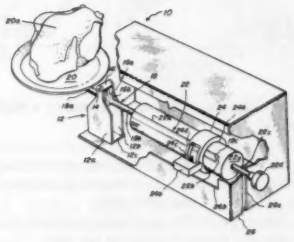
said units, when employed between a three cone rock bit and an upper drill string having a mass of 32,000 pounds, rotating at one revolution per second, providing at said zero deflection neutral position, a frequency ratio in excess of the square root of two.

4,276,948

MICROWAVE OVEN COOKING TIME SCALE

Donald H. Nichols, 4324 IDS Center, Minneapolis, Minn. 55402

Filed Jan. 18, 1979, Ser. No. 4,297
Int. Cl.³ G01G *23/22, 19/00*
U.S. Cl. 177—44 **3 Claims**



1. Microwave oven cooking time scale for determining the length of time to cook a particular piece of food as a function of a predetermined temperature comprising:

a. balance beam scale means including a fulcrum support means, a fulcrum point positioned on said fulcrum support means, a cylindrical means supported on said fulcrum point and including a downwardly extending pivot means and balance beam means extending longitudinally and at right angles from both sides of said pivot means;

b. food container means positioned on one side of said balance beam means for weighing food on said scale;

c. cylindrical information microwave chart means rotatably engaged over the other end of said balance beam means and being of a weight to substantially equal and compensate for said food container means in which said food is weighed and including longitudinally extending rod including a knurled knob at one end, and an informational chart columnly divided as a function of temperature and time and subdivided into at least one subdivision column for cooking efficiencies of food, each subdivision corresponding to low efficiency, medium efficiency, and high efficiency of food for microwave cooking;

d. counterweight means including a cylindrical member engaged over said chart means and including a transparent window, a knob extending horizontally outward, and pointer extending vertically upward and encompassing a portion of said transparent window; and,

e. housing means covering said scale including a rectangular configuration having a horizontal rectangular window substantially corresponding to the diameter and length respectively of said cylindrical information chart means and a substantially upward extending rectangular vertical slot to accommodate said longitudinal rod extending from said chart means whereby said food is placed on said container means and said counterweight means is respectively adjusted to substantially align said information

cylinder means with said horizontal window means thereby indicating the temperature, time and efficiency of the food microwave cooking conditions.

4,276,949

ELECTROMAGNETIC FORCE-COMPENSATING WEIGHING APPLIANCE

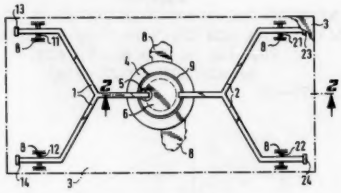
Erich Knothe, Bovenden; Christoph Berg, Adelebsen, and Franz J. Melcher, Hardegsen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,036

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853073

Int. Cl.³ G01G *7/00, 3/14*

U.S. Cl. 177—212 **9 Claims**



1. An electro-magnetic force-compensating weighing appliance comprising:

a load scale;

at least two levers having opposite ends and extending at one of their respective ends in supporting relationship with opposite portions of the load scale;

said levers being pivotally supported between their ends;

stationary magnet means having an air gap;

each lever bearing a compensating coil at their respective other ends and said compensating coils being immersed in the magnet means air gap to interact therewith, whereby the location of the load on the load scale determines the proportion each coil contributes to the counter force produced and the sum of the force compensation effected by the coils provides a load-proportional measuring signal, thus eliminating the need for mechanical coupling between the levers.

4,276,950

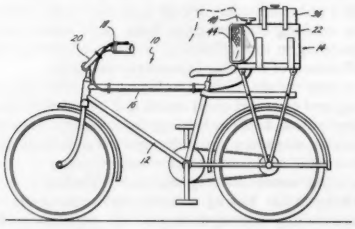
POWER ASSISTED PEDICYCLE

John M. Vance, Bryan, Tex., assignor to J. Wylie Harris, Jr., Houston, Tex.

Filed Apr. 11, 1979, Ser. No. 29,096

Int. Cl.³ B62D *57/04*

U.S. Cl. 180—7 P **4 Claims**



1. A power assisted pedicycle comprising

a frame

a plurality of wheels, each wheel rotatably mounted to the frame

a seat for the rider mounted on the frame

a set of handlebars mounted to the frame

a power package having

a housing secured to the rear of the frame of the pedicycle behind the seat, the interior of the housing having a circumferential groove lined with fibrous material, the housing having a rear end having a protective guard mounted over it to prevent foreign objects from entering the housing, and a front end having formed integrally thereof two opposed air inlets which project outwardly and away from the plane of the pedicycle, each air inlet having a protective guard mounted over it,

an engine mounted within the housing, the engine having a drive shaft extending therefrom, the engine enclosed in a suitable acoustic material to reduce noise generated by the engine, the engine having a throttle,

a throttle control extending from the throttle to the handle bars and secured to the handle bars so that the speed of the engine is conveniently adjustable,

a pull mechanism connected to the engine and extending through the housing for starting the engine,

a propeller secured to the drive shaft and mounted so that the tips of the propeller travel in the circumferential groove of the housing immediately adjacent the fibrous material thereby providing motive force, and

a fuel tank in fluid communication with the engine.

4,276,951

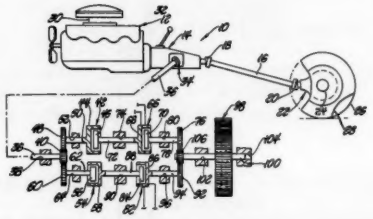
VEHICULAR ENERGY STORING MEANS AND SYSTEM

Marion L. Smitley, Birmingham, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Continuation-in-part of Ser. No. 796,754, May 13, 1977, abandoned. This application Apr. 16, 1979, Ser. No. 30,567

Int. Cl.³ B60K *9/04*

U.S. Cl. 180—165 **19 Claims**



1. An energy storing and supplying system for a vehicle having a prime mover and surface-engaging vehicular propelling drive wheel means, comprising vehicular primary power transmitting means operatively interconnecting said prime mover and said wheel means, a flywheel, and secondary power transmitting means operatively connected to said drive wheel means and to said flywheel, said secondary power transmitting means being effective during a first condition of operation of said vehicle for transmitting energy from said vehicle drive wheel means and into said flywheel as to thereby impart rotation to said flywheel, said secondary power transmitting means being effective during a second condition of operation of said vehicle for transmitting energy from said flywheel during its rotation and into said drive wheel means as to at least assist in propelling said vehicle, said secondary power transmitting means including clutching means to prevent during all conditions of operation of said vehicle the transfer of any power from said prime mover to said flywheel and from said flywheel to said prime mover.

4,276,952
APPARATUS FOR INSTALLING VEHICLE COMPONENTS

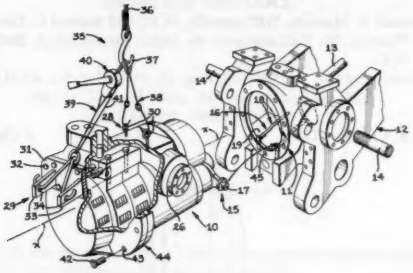
Alvin L. Kuhfuss, Jr., Morton, and Craig W. Riediger, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

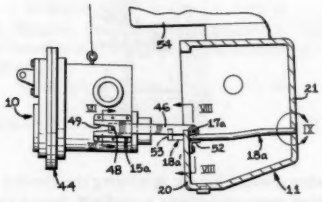
PCT No. PCT/US79/00158, §371 Date Mar. 16, 1979, §102(e) Date Mar. 16, 1979, PCT Pub. No. WO80/01894, PCT Pub. Date Sept. 18, 1980

This PCT application filed Mar. 16, 1979, Ser. No. 81,220

Int. Cl.³ B60K *5/10*

U.S. Cl. 180—294 **10 Claims**





1. In a vehicle having a stationary support (**11**), a component (**10**) removably mounted on said support (**11**), first guide means (**15***a*) on said component (**10**) for supporting and guiding said component (**10**) between removed and installed positions thereof relative to said support (**11**), second guide means (**16***a*) on said support (**11**) for engaging said first guide means to support and guide movements of said component (**10**) between its removed and installed positions, and fastening means (**42**) for releasably securing said component (**10**) to said support (**11**) when said component (**10**) is in its installed position, the improvement comprising:

said first guide means (**15***a*) including a bar and means (**47**) for slidably mounting said bar (**46**) on said component (**10**) for reciprocal movement thereon between extended and retracted positions.

4,276,953
SHIFT LINKAGE FOR A TILT CAB TRUCK

Roger P. Penzotti, Livermore, and Gordon F. Schmeisser, Aptos, both of Calif., assignors to Paccar Inc., Bellevue, Wash.

Filed Jan. 28, 1980, Ser. No. 115,763

Int. Cl.³ B62D *27/06;* **B60K** *23/00*

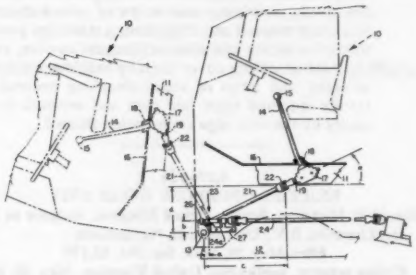
U.S. Cl. 180—328 **11 Claims**

1. A gear shift linkage for a cab-over-engine type truck having a shift lever extending up through the cab floor, said linkage enabling the forward tilting of the cab on the frame about the cab pivot axis without disengagement of the shift linkage and without dislocation of the shift lever from the cab, comprising:

a shifter control unit secured to the cab just below the floor and having an output shaft, the shift lever having a base pivotally mounted to the control unit, and the control unit being operably connected to receive side-to-side movement of the shift lever and translate it into rotation of the output shaft, and to accept forward and rearward movement of the shift lever and translate it into generally forward and rearward movement of the output shaft;

a transmission linkage shaft oriented generally horizontally and adapted for operable connection to a transmission, and bearing means connected to the truck frame and mounting the transmission linkage shaft for axial sliding movement and rotational movement to operate the transmission;

control shaft means connecting the control unit output shaft with the transmission linkage shaft for transferring rotary



and axial movement of the output shaft to the transmission linkage shaft, with first flexible connection means connecting the output shaft to one end of the control shaft and second flexible, pivotal connection means joining the other end of the control shaft with the transmission linkage shaft;

said control shaft means and transmission linkage shaft forming a sharply acute angle at the second connection means at the forward ends of the two shafts; and

said connection means being located near the cab pivot axis;

whereby, upon forward tilting of the cab, the shift lever undergoes minor changes of position which depend upon the lever's initial position, but the lever remains connected in the shift linkage.

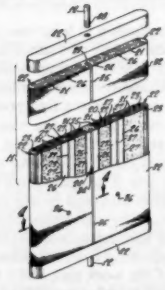
4,276,954
ADJUSTABLE LIGHT AND AIR-ADMITTING WINDOW THERMAL AND ACOUSTIC BARRIER SYSTEM

Paul L. Romano, Orange, Calif., assignor to Acoustic Standards, Orange, Calif.

Filed Oct. 1, 1979, Ser. No. 80,337

Int. Cl.³ E04F *17/04;* **E04B** *1/343, 1/82;* **E06B** *9/26*

U.S. Cl. 181—224 **5 Claims**



1. An adjustable light and air-admitting thermal and acoustic barrier, comprising a plurality of sound and heat transfer atten-

uating blades pivotally mounted in longitudinally parallel and mutually spaced apart relation, each said blade comprising:

(a) a self-supporting core of sound reflective material, said core comprising

(1) an elongated web,

(2) generally C-shaped side edge flanges on said web having opposite ends defining laterally inwardly projecting lips on opposite sides of and spaced apart from said web, the lips of opposite side edge flanges extending towards each other substantially parallel to and spaced from the web to define longitudinally extending cavities on opposite sides of the web with the lips of said side edge flanges partially overlying and partially enclosing such cavities,

(3) a plurality of strips of sound-absorbing insulating material positioned in respective ones of said cavities, said lips partly overlying said strips of sound-absorbing insulating material and compressing side edge portions thereof to secure said strips within said cavities, and

(4) a sound-absorbing cover laterally enfolding said core, whereby said strips of sound-absorbing material are readily mounted upon said core and retained in said cavity by the side edge compression thereof.

4,276,955

MULTIPLE-PURPOSE WORK UNIT

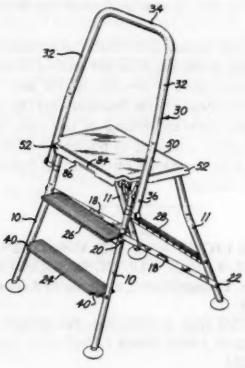
Ronald P. Hickman, Jersey, United Kingdom, assignor to Tekron Licensing B.V., De Leersum, Netherlands

Filed May 29, 1979, Ser. No. 43,179

Claims priority, application United Kingdom, May 30, 1978, 23899/78; Dec. 29, 1978, 50193/78; Dec. 29, 1978, 50194/78; Dec. 29, 1978, 50195/78

Int. Cl.³ A47C *13/00*; B25B *1/10*

U.S. Cl. 182—33 **41 Claims**



1. A portable combination step stool-stepladder-workbench unit, comprising:

(a) a substructure including at least one step;

(b) a top structure carried by said substructure and including (1) a vise unit, (2) a seat-forming member, and (3) means for mounting said seat-forming member on said top structure for movement between a first position, in which the seat-forming member overlies the vise unit and defines a seating surface, and a second position, in which the seat-forming member is out of overlying relation to the vise unit and the vise unit is accessible for use; and

(c) a handrail member attached to one of the top structure and the substructure for movement between a raised position, in which the handrail member extends above said top structure for supporting a user standing on a step or the seating surface of the work unit, and a storage position, in which the handrail member extends downward along the substructure;

whereby the unit can be used interchangeably as a step stool, with the seat-forming member in said first position and the handrail in said storage position, as a stepladder, with the seat-forming member in said first position and the handrail in said raised position, and as a workbench with said seat-forming member in said second position and said handrail in said storage position.

4,276,956

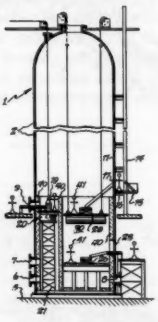
SWING SCAFFOLD FOR HOT BLAST STOVE CHECKER CHAMBER RELINING

Ronald S. Mamula, Williamsville, N.Y., and Samuel C. Dotson, Weirton, W. Va., assignors to Andco Incorporated, Buffalo, N.Y.

Division of Ser. No. 935,706, Aug. 21, 1978, Pat. No. 4,221,537. This application Jan. 16, 1980, Ser. No. 112,611

Int. Cl.³ E04G *3/10, 5/08*

U.S. Cl. 182—128 **3 Claims**



1. A swing scaffold for use in relining the checker chamber of a hot blast stove comprising a platform shaped to conform with the shape of the checker chamber, an open grill in said platform to permit air flow through said scaffold from one side to the other, and a catch board suspended from said platform to catch debris passing through said grill and prevent it from falling into the chamber below.

4,276,957

PORTABLE SCAFFOLD ASSEMBLY WITH MOVABLE ANCHOR

H. Lee Kilgore, 5563 Rattlesnake Hammock Rd., C-11, Naples, Fla. 33942

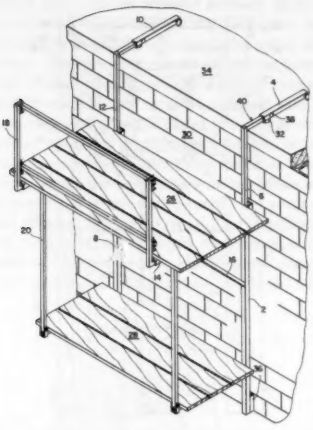
Filed Jan. 8, 1980, Ser. No. 110,508

Int. Cl.³ E04G *3/08, 3/10*

U.S. Cl. 182—130 **4 Claims**

1. A portable scaffold assembly adapted to be engaged and supported upon a vertically extending portion of a building structure, said scaffold assembly comprising a pair of vertically extending, open-ended tubular members, each member having at least one horizontally extending walkway support for supporting a superposed walkway thereon, an upper arm which is adjustably fitted, at a proximate end, for a telescopic engagement within said tubular member, said each upper arm further comprising, at its distal end, a horizontally extending portion which is adjustably fitted to enter a first end and engage within a horizontally extending, open-ended tubular member which extends horizontally to a second end and comprises an anchor said anchor further comprising a vertically extending portion proximate said first end, and adapted to be adjustably and

removably fit against a vertically extending first portion of a building structure, whereby each of said vertically extending



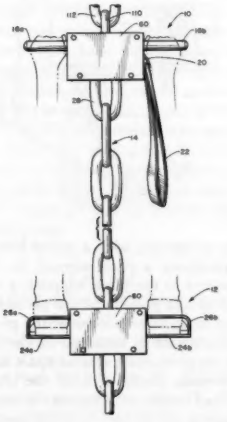
scaffold tubular members will thereby engage the opposite side of said vertically extending structure portion.

4,276,958

PERSONNEL CHAIN CLIMBER

Clifford I. Skaalen, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 21, 1980, Ser. No. 142,281
Int. Cl.³ A63B *27/00*
U.S. Cl. 182—135 **11 Claims**



1. Apparatus for use by a person in ascending or descending a chain comprising:

a rigid assembly having a central opening, the chain being disposed through said opening during operation of said apparatus;

a pair of parallel cam pins fixed to said rigid assembly and disposed in said central opening, said pins being on opposite sides of said chain in said opening;

a pair of cams disposed in said assembly on opposite sides of said chain for mating with a link of said chain, each said cam having an elongated aperature through which one of said cam pins is disposed, each said cam being free to rotate about said cam pin and slidable upward and downward on said cam pin as permitted by said elongated aperture;

a pair of resilient means, each resilient means coupled between one of said cams and said rigid assembly for urging said cams inward toward said chain in a direction normal to the direction of said cam pins; and

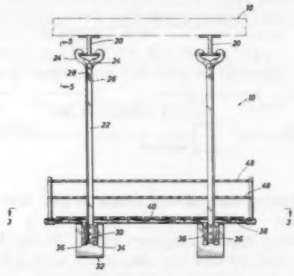
a pair of cam stops fixed to said assembly, each said cam stop projecting inward on opposite sides of said chain into said central opening toward said cam pins for mating with one of said cams when said cams are mated with a link of said chain.

4,276,959

QUICK WAY SCAFFOLD

Ronald A. Barber, 519 S. Harrison St., West, Tex. 76691

Filed Aug. 23, 1979, Ser. No. 68,915
Int. Cl.³ E04G *3/10, 5/06*
U.S. Cl. 182—150 **12 Claims**



1. A scaffold structure adapted to be rigged beneath and supported from a set of horizontal beams comprising:

(a) upright hanger strap means defining a pair of spaced apertures at the upper end thereof, said strap means having a central elongate portion of specified length extending downwardly from said hook means and terminating at a lower end beam support means;

(b) a pair of oppositely facing hook elements each having a hook portion for engagement with a flange of a beam and each defining a downwardly extending shank having spaced apertures formed therein;

(c) a pair of bolts extending through said apertures of said shank portions of each hook element and extending through said apertures of said hanger strap means and securing the same in immovable assembly with said strap means;

a beam extending between a pair of upright hanger strap means rested on said beam support means, said beam having an extent enabling a deck to be positioned thereon; and

wherein at least two of said upright hanger support means cooperatively support said beam spaced below a platform by a distance determined by the length of said strap means.

4,276,960

OIL DISTRIBUTING MEANS

Paul D. Webb, Tioga, Pa.; William J. Kiefer, and James M. Aumick, both of Addison, N.Y., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 17, 1979, Ser. No. 39,811
Int. Cl.³ F04B *39/02*
U.S. Cl. 184—6.22 **17 Claims**

1. Oil distributing means, for a gas-compressing or like system, comprising:

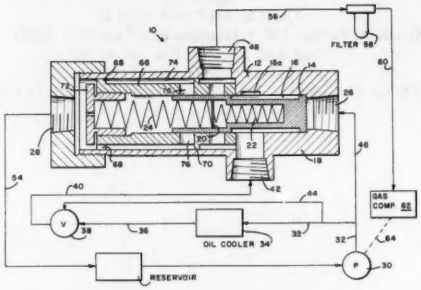
a housing having a given chamber formed therewithin;

a first port formed in said housing, and opening into said chamber at a first location, for admitting oil into said chamber;

a second port formed in said housing, and opening into said chamber at a second location spaced apart from said first location, for discharging oil from said chamber;

valving means slidably disposed in said chamber;

said valving means having closure means for closing off said first and second ports from communication with each other, in a first slidable disposition of said valving means, and for opening said first and second ports to mutual communication, in a second slidable disposition of said valving means; and



means biasing said valving means in said first disposition; wherein

said biasing means comprises means urging said valving means toward said first disposition with a first range of biasing forces, upon said valving means slidably moving away from said first disposition and in the direction of said second disposition, through a first, given distance of slidable movement thereof, and with a second range of biasing forces, upon said valving means slidably moving in said direction through a second distance beyond said first, given distance; and further including

means for addressing a counter-biasing force to said valving means to effect slidable movement thereof in said direction.

4,276,961

MAST AND CARRIAGE ASSEMBLY

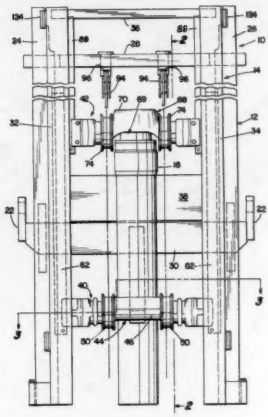
Jun-ichi Sugiyama, Philadelphia, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 12, 1979, Ser. No. 19,689

Int. Cl.³ B66B 9/20

U.S. Cl. 187—9 E **8 Claims**

1. In an industrial truck, a stationary upright assembly, a movable upright assembly mounted for vertical movement relative to said stationary upright assembly; a load carriage mounted for vertical movement relative to said movable upright assembly; a lift cylinder having a cylinder body and a vertically extendible ram assembly; means mounting said cylinder for bodily vertical movement relative to said stationary and movable upright assemblies; means interconnecting said stationary upright assembly, said cylinder and said load carriage whereby extension of said ram assembly lifts said load carriage relative to said upright assemblies; first stop means mounted on said load carriage and engageable with said ram assembly to limit upward movement of said load carriage relative to said ram assembly; second stop means attached to said movable upright assembly; and means mounted on said load carriage for engagement with said second stop means to cause said movable upright assembly to move upward when



said ram assembly is extended beyond the point wherein said first stop means engages said ram assembly.

4,276,962

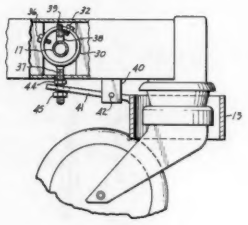
CASTER BRAKE FOR STRETCHER OR THE LIKE

Clarence J. Aulik, Manitowoc, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 9, 1979, Ser. No. 18,979

Int. Cl.³ F16D 49/00

U.S. Cl. 188—1 D **12 Claims**



1. A stretcher or the like with a wheel brake, wherein the improvement comprises: a pivot support on the stretcher; a pivot arm connected to the pivot support; a wheel engaging brake connected to one portion of the pivot arm; a coupling means connected to another portion of the pivot arm; and an elongated actuator rotatably mounted on the stretcher or the like and having longitudinally spaced apart torque receiving and torque delivering portions, with the torque delivering portion being joined to the coupling means, whereby applying a rotational torque to the torque receiving portion of the elongated actuator engages and disengages the wheel brake.

4,276,963

SPREADING DISC BRAKES FOR VEHICLES

Robert A. Anderson, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 14, 1979, Ser. No. 94,232

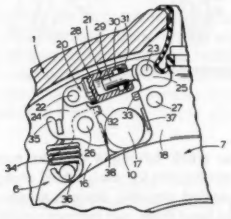
Claims priority, application United Kingdom, Nov. 14, 1978, 44327/78

Int. Cl.³ F16D 55/16, 55/18

U.S. Cl. 188—71.4 **5 Claims**

1. A self-energising spreading disc brake comprising a hous-

ing having opposed spaced radial surfaces, friction discs within said housing provided with friction linings for engagement with said radial surfaces, stationary pilot lugs in said housing, a servo pressure plate and an arrested pressure plate located between said friction discs, centred by said pilot lugs and relatively movable both axially and angularly, a stop abutment in said housing, said pressure plates having adjacent faces provided with co-operating oppositely inclined recesses, and balls or rollers located in said recesses, wherein said brake is initiated by moving said pressure plates in opposite directions into engagement with said friction discs which, in turn, are urged into engagement with said radial surfaces whereafter said pressure plates are carried round with said discs until said arrested pressure plate is arrested by said stop abutment and the continued angular movement of said servo-pressure plate provides a servo-action, and wherein an automatic slack adjuster is located within said housing, said adjuster comprises an extensible strut which is floatingly mounted within said hous-



ing and acts to maintain said pressure plates in relative angular positions in which braking clearances are maintained within predetermined limits, said strut being extensible automatically when angular movement of said servo plate relative to said arrested plate in the application of the brake exceeds a predetermined value due to wear of said friction linings, at least one spring-loaded member through which said strut acts between said pressure plates, said spring-loaded member being operative to preclude extension of said strut at a limit point when a drag-force between said arrested plate and said stop abutment exceeds the spring loading applied to said member, said member comprising a lever through which said strut is coupled to one of said plates, a pivotal connection between said lever and said plate, and a spring for urging said lever into a neutral position, the load in said spring being chosen to permit said lever to move angularly about said pivotal connection to prevent the effective length of said strut from being increased further at said limit point.

4,276,964

CALIPER CARRYING STRUCTURE OF PIN-SLIDE TYPE DISC BRAKE

Yoichi Iwata, Satte, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1979, Ser. No. 92,842

Claims priority, application Japan, Nov. 17, 1978, 53-141883

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.3 **12 Claims**

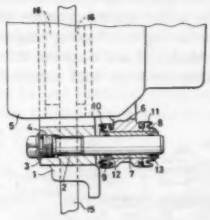
1. A caliper carrying structure for a pin-slide type disc brake having a caliper member which is carried by a support member in such a way as to be slidable in the axial direction of a disc and is arranged to push a friction pad against said disc, said caliper carrying structure comprising:

a slide pin which is secured to one of said two members;

an opening provided in the other of said two members and arranged to have said slide pin inserted therein;

a rigid sleeve disposed between said slide pin and said opening and arranged to be slidable on both said slide pin and said opening;

a first sliding part provided between said opening and said sleeve; and



a second sliding part provided between said slide pin and said sleeve.

4,276,965

FLOATING CALIPER SPOT TYPE DISC BRAKE

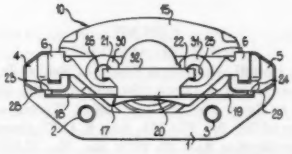
Hajo Pickel, Kelkheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 16, 1979, Ser. No. 66,960

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840374

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.5 **15 Claims**



1. A floating caliper spot type disc brake comprising:

a brake support member disposed substantially parallel to a brake disc, said support member having a pair of arms extending over the periphery of said disc;

a brake caliper being disposed to embrace said disc and axially slidably guided on said support member and disposed between said pair of arms; and

a spring clamping said caliper relative to said support member radially, said spring including

a middle section fastened to an end surface of said caliper parallel to said disc and remote from an actuating device for said brake, and

two spring arms extending substantial parallel to said discs in opposite directions from said middle section, each of said two spring arms being in slidable abutting engagement with a different one of said pair of arms of said support member.

4,276,966

AUTOMATIC ADJUSTING STRUT

David T. Ayers, Birmingham, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

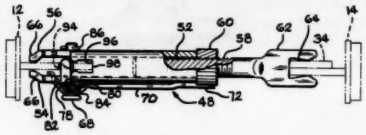
Filed Nov. 16, 1978, Ser. No. 961,322

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—79.5 P **15 Claims**

1. A self-adjusting strut comprising: a carrier body having a longitudinally extending opening therein; a threaded extensible member projecting in one direction out of said longitudinally extending opening; star wheel means for causing said extensible member to be threaded outwardly of said opening in said direction; a ratchet lever rotatably supported along the side of said carrier with a finger portion positioned for engaging said

star wheel means; first and second spaced apart adjuster abutments on said carrier facing in the opposite direction from said extensible member, said first adjuster abutment being adapted to be engaged by a first driven structure abutment it adjusts, said ratchet lever having an actuating tang adapted to abut said second adjuster abutment and a second driven structure abutment, the distance between said adjuster abutments being



greater by a predetermined distance than is the spacing of the driven structure abutments; and whereby after a predetermined driven structure movement away from said carrier, the actuating tang is moved by the second driven structure abutment to rotate said ratchet lever and in turn rotate said star wheel means to thread said extensible member out of said carrier body.

4,276,967

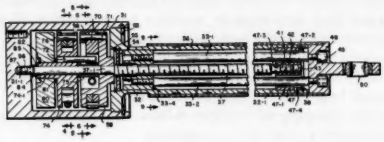
SNUBBER ASSEMBLY

Terrence P. Dowell, Van Nuys; Edwin L. Banks, Jr., Lakeview Terrace, and Carl T. Luce, Woodland Hills, all of Calif., assignors to Barry Wright Corporation, Watertown, Mass.

Continuation of Ser. No. 822,241, Aug. 5, 1977, abandoned. This application Apr. 20, 1979, Ser. No. 31,976

Int. Cl.³ F16F *7/06, 7/10*

U.S. Cl. 188—134 **7 Claims**



1. A snubber comprising first and second concentric arranged elements, means for mounting said elements for telescopic motion relative to each other along a common axis, a shaft axially fixed relative to said first element and rotatable by said second element, a braking surface on said first element, a driver fixed to said rotatable shaft for rotation therewith, a primary brake assembly mounted on said driver, an inertia mass supported by said shaft and freely rotatable about said shaft relative to said driver, brake actuating means interconnecting the inertia mass and the primary brake assembly, said inertia mass being rotated by said brake actuating means, said primary brake assembly being applied to said braking surface when acceleration between elements exceeds a predetermined value of acceleration causing the inertia mass to rotationally lag the driver and a velocity sensitive brake assembly mounted on the inertia mass and operable by centrifugal force when the rate of rotation of the inertia mass exceeds a predetermined value of velocity to frictionally engage said braking surface to brake rotation of said inertia mass to thus increase the force applied by the primary brake assembly through said brake actuating means whereby the force is increased due to the aforementioned lagging of the inertia mass.

4,276,968

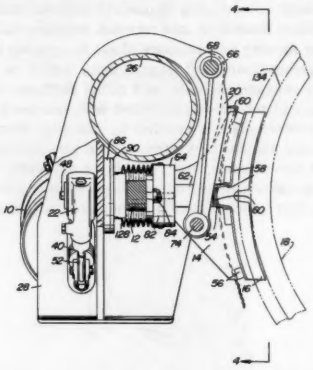
RAIL CAR BRAKE SYSTEM

Alan R. Cripe, and Christopher A. Cripe, both of Richmond, Va., assignors to Bi-Modal Corporation, Greenwich, Conn.

Filed Apr. 10, 1978, Ser. No. 894,731

Int. Cl.³ B60T *1/04;* **F16D** *65/52*

U.S. Cl. 188—153 R **6 Claims**



1. In a rail car truck having a support member and rail wheels, a brake mechanism for each wheel comprising a brake head and shoe carried thereby, hanger means pivotally suspending said brake head from said support member, a long-lead screw, a nut carried by said brake head and receiving one end of said screw, a housing mounted on said support member, anti-friction bearing means in said housing and rotatably supporting the other end of said screw, a pneumatic cylinder and push rod operative thereby and means connecting said push rod with the outer end of said screw whereby admission of compressed air into said cylinder will rotate said screw and advance said brake head and shoe essentially linearly towards and into braking engagement with a wheel, said bearing and hanger means acting to minimize frictional resistance to the linear motion of said brake head while maintaining said brake head positively in proper angular relationship with said wheel, said bearing means including a diametrically split spherical bearing providing opposed spaced planar faces, one of which split bearing portions is mounted for rotation with said screw and the other of which floats thereon, a pair of rings in said housing providing an outer race for each of said split bearing portions respectively, and an anti-friction, free-floating roller bearing positioned on said screw between said faces and bearing thereon to combine with said floating split bearing portion and absorb reactive thrust when the brake is applied while said spherical bearing carries the radial loads.

4,276,969

METHOD AND MEANS FOR FASTENING FRICTION WEAR PADS

Robert W. Chin, Akron, Ohio, and Walter J. Krause, Bradenton, Fla., assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Apr. 2, 1979, Ser. No. 15,260

Int. Cl.³ F16D *65/10*

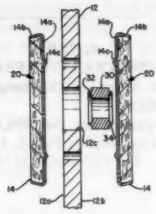
U.S. Cl. 188—218 XL **4 Claims**

1. A friction component comprising:

a substantially disk-like core member having a plurality of mounting apertures formed therein at a specific distance from the core axis and at equal angular positions about the core member;

a plurality of cup-like friction pads containing friction material within the cup mounted on opposite face surfaces of the core member, two such pads in mutual base-to-base alignment with one of said apertures; and

a plurality of substantially cylindrical metal bushings each positioned in one of said mounting apertures, said bushings having a diameter to wall thickness ratio equal to at least 3:1 and having annular projections at the ends thereof that are substantially triangular in cross-section and extend the total bushing length beyond the core aperture by an



amount equal to the projections, said projections being in contact with respective bases of two aligned pads such that upon subjection to an electric welding current said pads and associated bushings are intimately resistance welded at the interface of the annular bushing projections and the pad bases and thus securely affixed to the core member.

4,276,970

HIGH SPEED HYDRODYNAMIC BRAKE

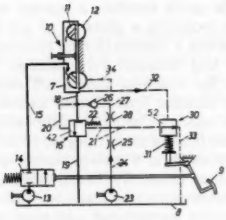
Berthold Herrmann, and Hans Lindenthal, both of Heidenheim, Fed. Rep. of Germany, assignors to Voith Getriebe KG, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 104,673

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855654

Int. Cl.³ F16D *57/02*

U.S. Cl. 188—296 **29 Claims**



1. A hydrodynamic brake comprising: a working chamber, which can be filled with working fluid; a rotor and a stator in said working chamber and positioned and operable such that working fluid in said working chamber operates on said rotor and said stator for causing braking torque; said working chamber having a working fluid outlet;

an overflow valve in said outlet for selectively permitting and prohibiting exit of working fluid from said working chamber through said outlet;

a regulating valve connected at a connection with said overflow valve for closing said overflow valve against flow out of said working chamber through said outlet and for opening said overflow valve; said regulating valve having a first condition at which said regulating valve closes said overflow valve; said regulating valve having a second condition at which said regulating valve causes said overflow valve to open for permitting outlet of working fluid from said working chamber through said outlet;

a brake operator for establishing a desired braking torque in said brake; said brake operator being connected with said regulating valve for adjusting said regulating valve to said first condition thereof;

said regulating valve also being connected with said working chamber for sensing the braking torque of said brake;

said regulating valve being adapted to compare the desired braking torque established by said brake operator with the actual braking torque in said brake, and said regulating valve adjusting its said condition to the selected first and second condition thereof which tends to equalize the two measurements of braking torque.

4,276,971

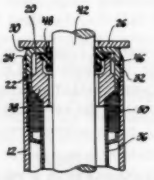
VEHICLE SUSPENSION STRUT WITH SERVICEABLE SHOCK ABSORBER

Richard A. Horvath, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1979, Ser. No. 94,691

Int. Cl.³ F16F *9/54*

U.S. Cl. 188—322 **5 Claims**



1. A motion damping and support strut for a vehicle suspension comprising an elongated outer tube forming a supporting part of the vehicle suspension, enclosure means closing one end of said outer tube, an elongated cylinder tube having a damping fluid therein mounted within said outer tube and coextending therewith, said tubes being radially spaced to define a fluid reservoir therebetween, a valved piston mounted for reciprocal movement in said cylinder tube, base valve means secured to said cylinder tube adjacent said enclosure means and cooperating with said piston to form a compression chamber, a rod guide mounted in the other end of said cylinder tube, a piston rod extending from said piston through said rod guide, a seal for said piston rod supported by said rod guide, a seal cover, fastener means for securing said seal cover to said outer tube, said outer tube having a helical threaded section in the inner wall thereof disposed adjacent to said seal cover, and external groove means on said outer tube transversely located between said fastener means and said helical threaded section to serve as a guide for a tool whereby said outer tube can be circumferentially cut to separate said outer tube into two parts so that one part can be moved from the other to facilitate removal of components supported within said other part so that said other part forms the entirety of said outer tube for reception of a replacement shock absorber cartridge.

4,276,972

METHOD OF, AND APPARATUS FOR, RETARDING THE MOTION OF A POWER DRIVEN VEHICLE

Stanley F. Burnett, Leyland; Michael Dunkley, LongridgeW.; Raymond M. Grimes, Charnock Richard, and Keith Parmee, Leyland, all of England, assignors to British Leyland UK Limited, London, England

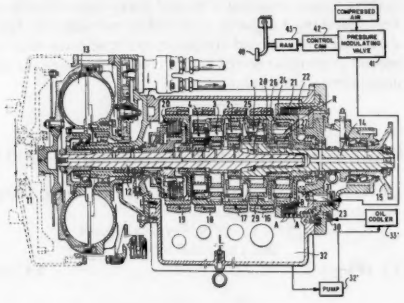
Filed Dec. 29, 1977, Ser. No. 865,586

Int. Cl.³ B60K *41/26*; F16D *67/00*

U.S. Cl. 192—4 C **6 Claims**

1. In a method of retarding a vehicle, equipped with a transmission utilising a sequence of epicyclic gear trains, each train being operable to link the input and output shaft to provide the desired relative potential speed difference: each of the trains incorporating a reaction member whose motion can be clamped by an associated clamping means to bring the train

into operation and having in addition a reverse gear train whose motion can be clamped by an associated clamping means to cause the output shaft to rotate in the opposite direction to its direction of rotation when any other gear train is



engaged; the improvement comprising the step of causing the clamping means for the reverse gear train to slip or act intermittently so as to cause a retarding torque to be applied to the output shaft by means of the reverse gear train.

4,276,973

CONTROL MECHANISM FOR A TRANSMITTING-PAWL AT A TRANSMISSION HUB FOR A BICYCLE

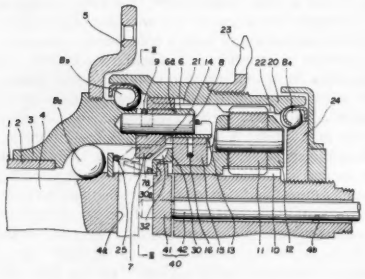
Seiji Fukui, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Sep. 4, 1979, Ser. No. 72,401

Claims priority, application Japan, Sep. 13, 1978, 53-126648[U]; Jan. 30, 1979, 54-11260[U]

Int. Cl.[3] G05G *1/00*; F16H *3/44*; F16D *41/30, 41/26*

U.S. Cl. 192—47 **5 Claims**



1. A control mechanism for a transmitting-pawl which is supported swingably around a shaft parallel to a hub shaft in a transmission hub of a bicycle, said pawl being biased into an active condition where said pawl is engaged with ratchet teeth of said transmission hub by means of a pawl spring, said control mechanism being operable to move said pawl so it disengages from said ratchet teeth and comprising a pawl control member supported movably to said hub shaft and an operating member for moving said control member axially of said hub shaft, said pawl control member being substantially cylindrical and being provided at the rear side thereof in the direction of its movement to control said pawl to disengage from said ratchet teeth with a holding portion having a peripheral surface which contacts with said pawl to retain said pawl in a condition of disengagement from said ratchet teeth, said control member being provided at the front side thereof in its moving direction with at least one pawl-receiving portion having a depressed face for receiving therein said pawl when said pawl is in its active condition, said control member being further provided at both circumferential sides of said pawl-receiving portion with control portions which are provided in continuation of the depressed face of said pawl-receiving portion and of said peripheral surface of said holding portion, said control portions having slant faces for controlling movement of said pawl received within said pawl-receiving portion to said disengaged condition.

4,276,974

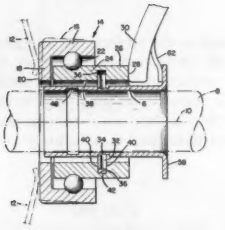
SELF-ALIGNING CLUTCH RELEASE BEARING

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corp., Detroit, Mich.

Continuation-in-part of Ser. No. 890,473, Mar. 27, 1978, abandoned. This application Feb. 5, 1979, Ser. No. 9,247

Int. Cl.[3] F16D *23/14*

U.S. Cl. 192—98 **48 Claims**



1. In an automobile power train or the like including a rotatable clutch having clutch release means, a guide member disposed substantially coaxial with the axis of rotation of the clutch and clutch actuating means, the improvement comprising a clutch release assembly slidably mounted on the guide member and reciprocable therealong by the actuating means for contacting the clutch release means, said clutch release assembly comprising a tubular bearing carrier slidably mounted on the guide member, a bearing supported on said bearing carrier including a plurality of anti-friction elements interposed between a stationary race member and a rotatable race member, said rotatable race member formed with an engaging face for engaging the clutch release means, said stationary race member formed with an internal surface disposed in radial spaced clearance relationship relative to the periphery of said bearing carrier, a groove extending inwardly of said internal surface, a spring washer disposed with its peripheral portion in axially biased preloaded engagement within said groove permitting restricted radial shifting movement between said carrier and said bearing and restricted angular displacement of the axis of said bearing relative to the axis of said carrier, said spring washer having plural layers of a helically wound serpentine strip of resilient material, engaging means on said carrier for retaining said spring washer in longitudinally fixed position therealong, and coacting means on said bearing carrier for preventing rotation of said carrier relative to the guide member.

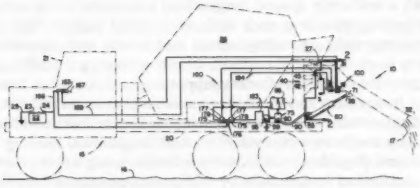
11. In an automobile power train or the like including a rotatable clutch having clutch release means, a guide member disposed substantially coaxial with the axis of rotation of the clutch and clutch actuating means, the improvement comprising a clutch release assembly slidably mounted on the guide member and reciprocable therealong by the actuating means for contacting the clutch release means, said clutch release assembly comprising a tubular bearing carrier slidably mounted on the guide member, a bearing supported on said bearing carrier including a plurality of anti-friction elements interposed between a stationary race member and a rotatable race member, said rotatable race member formed with an engaging face for engaging the clutch release means, said stationary race member formed with an internal surface disposed in radial spaced clearance relationship relative to the

periphery of said bearing carrier, a groove extending inwardly of said internal surface, a spring washer disposed with its peripheral portion in axially biased preloaded engagement within said groove permitting restricted radial shifting movement between said carrier and said bearing and restricted angular displacement of the axis of said bearing relative to the axis of said carrier, engaging means on said carrier for retaining said spring washer in longitudinally fixed position therealong, and coacting means on said bearing carrier for preventing rotation of said carrier relative to the guide member, said coacting means comprising a radially extending flange formed with a radially extending notch therein.

4,276,975
INCLINATION MAINTAINING SYSTEM FOR A DISCHARGE CHUTE

Eugene M. Jenkins, 206 E. Camino Colegio, Santa Maria, Calif. 93454

Filed Nov. 1, 1978, Ser. No. 956,648
Int. Cl.³ B65G *11/12*
U.S. Cl. 193—10 **4 Claims**



1. For use with a truck for transporting ready-mix concrete or the like including a body and an elongated discharge chute having a receiving end pivotally mounted on the body for movement about a mounting axis extending substantially horizontally and transversely of the chute and a distal end, an inclination maintaning system for said chute comprising:

A. contractible and extensible powered means having opposite ends connected to said chute and to said body,

B. a mass movably mounted on the chute for gravitational motivation between a first position when the chute is pivoted about said mounting axis so that the longitudinal axis of the chute has an inclination to the horizontal less than a predetermined angle and a second position when the chute is pivoted so that said inclination is greater than said predetermined angle, the first and second positions of the mass being individually defined by a pair of sensors disposed on opposite sides of the mass along the longitudinal axis of the chute,

C. means pivotally mounting the sensors on the chute for corresponding movement about an axis substantially parallel to the mounting axis of the chute,

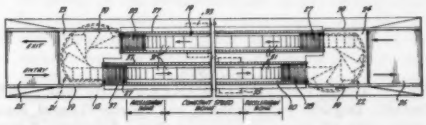
D. a powered, reversible, remotely controlled drive connected to the sensor mounting means for simultaneously moving the sensors pivotally about their axis to adjust said predetermined angle, and

E. control means responsive to movement of the mass for contracting said contractible and extensible means when the mass is in the first position and for extending said contractible and extensible means when the mass is in the second position so that said inclination of the chute is maintained substantially at said predetermined angle.

4,276,976
ACCELERATING AND DECELERATING MOVING WALKWAY WITH MINIMAL WALKWAY SURFACE IRREGULARITIES

Phillip E. Dunstan, and Charles H. McConnell, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 20, 1978, Ser. No. 926,336
Int. Cl.³ B65G *23/00*
U.S. Cl. 198—334 **32 Claims**



1. In an accelerating and decelerating moving walkway that includes a plurality of overlapping platforms driven along a substantially horizontal path-of-travel that includes linear regions joined by change-of-direction regions, said platforms having leading edges and trailing edges, said accelerating and decelerating moving walkway also including an overlapping control means for controlling the relative acceleration and deceleration of the walkway by controlling the amount of overlap between adjacent platforms as the platforms are driven along said substantially horizontal path-of-travel, the improvement comprising change-of-direction means, located in the change-of-direction regions, for separating, turning and bringing together adjacent platforms, said change-of-direction means including:

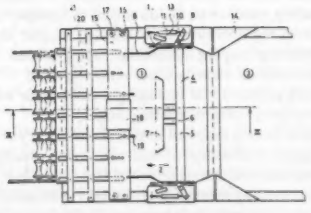
support means for supporting the trailing edge of said platforms in said change-of-direction regions as said adjacent platforms are separated, turned and brought back together; and,

accelerating and decelerating means forming part of said overlapping control means for accelerating said platforms in said change-of-direction regions to separate adjacent platforms and for decelerating said platforms in said change-of-direction regions to bring adjacent platforms together.

4,276,977
DISTRIBUTION AND CONVEYOR APPARATUS FOR EGGS

Hendrik J. van Kattenbroek, Barneveld, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed May 4, 1978, Ser. No. 902,718
Claims priority, application Netherlands, May 5, 1977, 7704938
Int. Cl.³ B65G *47/68*
U.S. Cl. 198—446 **15 Claims**



1. Distribution and conveyor apparatus for eggs comprising a moveable supporting surface for transport of the eggs, and at least one thin flat transverse member for controlling the distribution of eggs on said support surface being fixedly disposed in overlying relationship with respect to said supporting surface

and extending completely across the width of the supporting surface such that all eggs transported by said supporting surface must pass over said at least one transverse member and said transverse member having a height above the support surface low enough for eggs to pass thereover when pushed by eggs behind them.

4,276,978

SHEET CONVEYOR FOR USE IN COPYING MACHINES

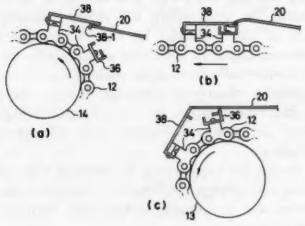
Masanobu Deguchi, Yamatotakada, and Takeshi Ikegami, Kurashiki, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1979, Ser. No. 81,434

Claims priority, application Japan, Oct. 8, 1978, 53/123929

Int. Cl.³ B65H *29/04*

U.S. Cl. 198—654 **8 Claims**



1. A sheet conveyor for conveying a sheet while the sheet being fed is held by a sheet gripper supported by a conveying means comprising:

a sheet gripper;

a conveying means for transporting said sheet gripper in a substantially straight direction and including means for changing the direction of said conveying means;

said conveying means including attachment means spaced at predetermined positions along a length of said conveying means;

said sheet gripper including a sheet pressure rod and a sheet retainer, said sheet pressure rod being affixed to a first pair of attachment means, said sheet retainer being affixed to a second pair of attachment means, said sheet pressure rod being disposed upstream in the direction of transporting with respect to said sheet retainer;

said sheet retainer being a substantially U-shaped member including, relative to the direction of transporting, a trailing long leg member and a leading shorter leg member, said trailing long leg member including at least one cut-out portion which forms a sheet retaining arm;

said sheet pressure rod including a hold plate with an outwardly projecting restricting finger;

wherein a sheet is supplied to said sheet conveyor during the changing of direction of said conveying means and abuts against said restricting finger of said hold plate, thereafter said conveying means travels in said substantially straight direction and said sheet pressure rod pivots said hold plate and said restricting finger into engagement with said sheet retainer whereby said sheet is sandwiched between said trailing long leg, said sheet retaining arm and said hold plate during transporting through said substantially straight portion and is released during a subsequent changing of direction of said conveying means.

4,276,979

SLAB COOLING AND CONVEYING APPARATUS

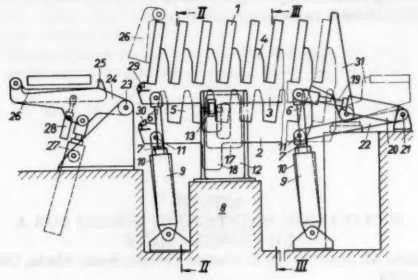
Horst Buschmann, Solingen-Ohligs, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 6,173

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1979, 2803705

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—775 **7 Claims**



1. Slab cooling and conveying apparatus comprising a plurality of conveyor beams arranged parallel and each formed with a uniformly spaced longitudinal succession of upwardly projecting shoulders each with an inclined support face for receiving slabs extending across said beams and supporting them in an "on edge" position, whereby cooling is facilitated;

pressure-medium cylinders supporting said conveyor beams from below and adapted to move said beams up and down;

displacement means for displacing said beams back and forth by an amount equivalent to said longitudinal spacing of said shoulders, said conveyor beams being moved vertically and horizontally by said pressure-medium cylinders and said displacement means, respectively;

a plurality of elongate and parallel support beams each provided with a like succession of said shoulders for supporting said slabs, laid across them, while said displacement means displaces the conveyor beams in the direction opposite to a conveying direction;

pressure-medium cylinders supporting said support beams from below and adapted to move said support beams up and down, the stroke of the pressure-medium cylinders in both sets of beams being greater than the projection of said shoulders;

guide rods pivotally connected at one end to said support beams and pivotally connected at the other end to a fixed member to guide said support beam for vertical movement only;

the conveyor beam pressure-medium cylinders being pivotally connected to the conveyor beams so that the conveyor beams can be moved by the displacement means while supported by the conveyor beam pressure-medium cylinders.

4,276,980

CONVEYOR BELT FOR CONVEYOR SYSTEM

Yoshio Oizumi, Ibaragi, Japan, assignor to Yamakyu Automatics Co., Ltd., Takatsuki, Japan

Filed Sep. 18, 1979, Ser. No. 76,613

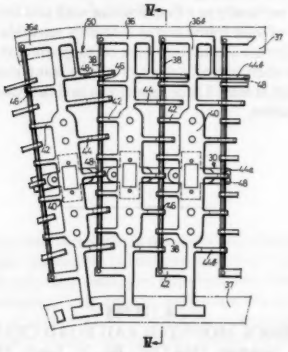
Claims priority, application Japan, Oct. 25, 1978, 53-147293[U]

Int. Cl.³ B65G *17/06*

U.S. Cl. 198—851 **4 Claims**

1. A conveyor belt for a conveyor system having a plurality of driving and driven wheels mounted for rotation about parallel axes with said wheels rotating in planes substantially paral-

lel to the plane of transport of the conveyor system and a chain reeved around and interconnecting said wheels, said belt comprises a plurality of support bar means arranged side by side having top surfaces in the plane of transport and a chain attached to the support bar means beneath the plane of transport, said chain being flexible in a plane parallel to the plane of transport, each of the support bar means having a plurality of branch bars projecting from each of opposite sides thereof, each of the support bar means having one group of branch bars on one side thereof interposed in an alternating arrangement



between another group of branch bars on the other side of another support bar means immediately adjacent thereto, a connecting rod fixedly extending through said one group of branch bars and loosely extending through slots formed in said another group of branch bars to interconnect the support bar means and render the support bar means movable longitudinally of the belt and turnable with respect to an adjacent support bar means in a horizontal plane within the range permitted by the loose arrangement of the connecting rod in the slots.

4,276,981

PUMP ASSEMBLY

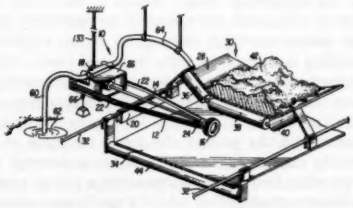
Frank K. Hurt, and Edwin L. Wellons, both of North Tazewell, Va., assignors to Mefcor, Inc., Bluefield, Va.

Division of Ser. No. 898,062, Apr. 20, 1978, Pat. No. 4,213,743, which is a continuation-in-part of Ser. No. 771,855, Feb. 23, 1977, Pat. No. 4,088,222. This application Jan. 8, 1980, Ser. No. 110,514

The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.

Int. Cl.³ B65G *35/00*

U.S. Cl. 198—866 **2 Claims**



1. An endless conveyer energy take-off system to be mounted on a rope-like member of an endless conveyer support adjacent to an endless conveyer for taking energy from said endless conveyer, said energy take-off system comprising:

an elongated frame;

a shaft journaled for rotation in said frame and extending longitudinally along said frame;

a drive wheel attached to and rotatable with said shaft, said drive wheel being positioned near a first end of said elongated frame;

an energy utilization means attached to said shaft and mounted on said elongated frame at a position spaced from said drive wheel for utilizing the rotary energy of said shaft;

a pivotal mounting means attached to said elongated frame for mounting said elongated frame on said rope-like member running parallel to said endless conveyer for allowing said elongated frame to pivot freely about said rope-like member with the weight of said frame and its attachments causing pivoting of said frame to bring said drive wheel into contact with said endless conveyer, said energy utilization means being mounted intermediate said pivotal mounting means and said drive wheel.

4,276,982

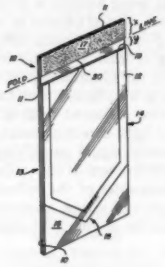
PRESSURE SENSITIVE TAPE CLOSURE POUCH

Joseph S. Sibrava, Chicago, Ill., and Frank E. Caroselli, North Arlington, N.J., assignors to Arvey Corporation, Chicago, Ill.

Continuation of Ser. No. 845,615, Oct. 26, 1977, abandoned. This application Apr. 10, 1979, Ser. No. 29,102

Int. Cl.³ B65D *33/20*

U.S. Cl. 206—439 **13 Claims**

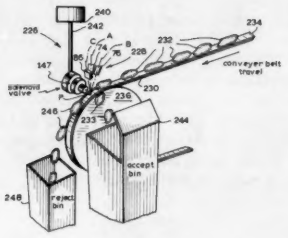


1. A sterilizable pouch comprising first and second opposing webs, said first web including a flap extending outwardly beyond one edge of the second web, said edge of said second web being free of said first web to provide an open mouth for said pouch, one of said webs being made from a transparent thermally stable material and the other said web being made of a steam permeable paper, said first and second webs being sealed to one another around the sides and bottom thereof to close said pouch except for said open mouth, sealing means for closing the mouth of said pouch and including a strip of adhesive on one of said webs adjacent to and spaced from said open mouth, thereby defining an adhesive free zone between said adhesive strip and said open mouth, means forming a fold line at the edge of said adhesive strip closest to said open mouth, said adhesive having a width that is greater than the width of the adhesive free zone whereby when said flap is folded about said fold line (a) said open mouth is sealed by said adhesive strip, and (b) the area from said fold line to said open mouth and throughout said adhesive free zone and an area on the web without said adhesive strip adjacent to said open mouth are engaged by said adhesive strip, to thereby form a contaminant-proof seal in said mouth, said adhesive strip having sufficient holding strength to said paper web to tear at least a portion of said paper web if said seal is opened, to thereby provide a telltale that the seal has been opened and avoid accidental resealing of a sterilized pouch.

4,276,983
SORTING APPARATUS

Theodore B. Witmer, Winona Lake, Ind., assignor to Bickley Manufacturing Company, Narberth, Pa.

Filed Oct. 23, 1978, Ser. No. 953,800
Int. Cl.³ B07C 5/344
U.S. Cl. 209—587 **4 Claims**

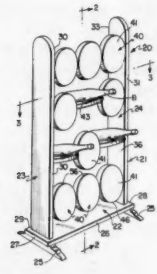


1. Sorting apparatus for sorting objects comprising means for causing said objects to travel in a predetermined direction or path, light emitting means for emitting light pulses at a sufficient frequency or periodic time intervals that each object is subjected to at least one light pulse, said light emitting means comprising a squarewave generator, a light emitting diode driver and associated light emitting diodes connected to said squarewave generator and means for varying the frequency of the generated square wave of said squarewave generator, said light emitting diodes being located in position to illuminate at least a portion of each of said objects as said objects travel in said predetermined direction or path, reflected light detecting means for detecting at least a portion of the reflected light pulses resulting from the illumination of at least a portion of each of said objects at a sufficient time frequency or periodic intervals to insure that reflected light is detected from each object, said reflected light detecting means including a phototransistor and associated signal amplifying circuit and means for varying the responsiveness of said reflected light detecting means to varying intensities of the reflected light in a given light frequency range, and means responsive to said reflected light detection means for sorting said objects based upon said reflected light.

4,276,984
WINE RACK

Bobbye C. Simmons, 511 Summit St., Ridgewood, N.J. 07450

Filed Apr. 24, 1979, Ser. No. 32,760
Int. Cl.³ A47F 7/28
U.S. Cl. 211—81 **3 Claims**

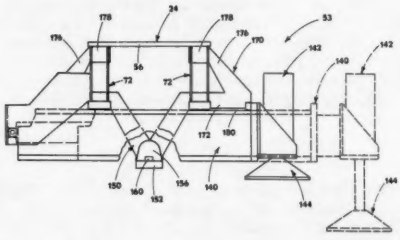


1. An apparatus for selectively supporting at least one container comprising frame means, said frame means including a pair of generally vertically disposed side walls, at least one shelf means disposed between said side walls, means for rotatably mounting said shelf means between said side walls, said shelf means having first and second surfaces, said means for mounting said shelf means being offset to one side of the center of mass of said shelf means so that said shelf means will normally assume a first vertical position in which said first surface of said shelf means is disposed substantially parallel to and viewable from one side of said frame means, said second surface of said shelf means having means for supporting a container thereon when said shelf means is rotated to a second position, and means for retaining said shelf means in said second position, whereby said shelf means normally is freely suspended vertically in a first position with said first side facing outwardly of said frame and is rotatably movable to a second position wherein a container may be supported on said second side of said shelf means, said shelf means being rotatable counterclockwise at least 270 degrees from said first position to said second position.

4,276,985
TRUCK MOUNTED RAILROAD CRANE

Timothy L. Newman, 1810 Craig Rd., St. Louis, Mo. 63141

Filed Sep. 17, 1979, Ser. No. 76,013
Int. Cl.³ B66C 23/62
U.S. Cl. 212—177 **9 Claims**



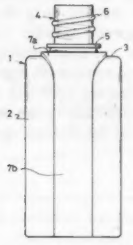
1. In a mobile vehicle including a frame and a boom mounted on said frame, stabilizing outrigger apparatus comprising supporting hanger means centrally disposed relative to said frame and extending downwardly therefrom for mounting oppositely directed outrigger beams, equal bearing means associated with the supporting hanger means for directing equal forces through the supporting hanger means to the frame during extensible or retractable movement of the oppositely directed outrigger beams, outrigger beam guide means supported by and extending laterally outwardly from said frame, outrigger beam support means aldo extending laterally outwardly from said frame and including means for distributing through the frame the load encountered when the outrigger beams are in engagement with the ground, the frame including an upper main bearing plate upon which the boom is mounted and an inner supporting frame section separating a pair of outer supporting frame sections, all of which underlie and support the upper main bearing plate for substantially the entire length thereof, the pair of outer supporting frame sections each having a rectangular cross sectional configuration, and said outrigger beam support means at least partially undergirding and being attached to the upper main bearing plate while also at least partially extending through and being attached to one of the outer supporting frame sections on each side of said frame.

4,276,986

BOTTLE MADE OF SATURATED POLYESTER RESIN

Takami Tsukada, Funabashi; Masao Akutsu, and Tadao Saito, both of Tokyo, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 74,881
Int. Cl.³ B65D *1/02*
U.S. Cl. 215—1 C 3 Claims



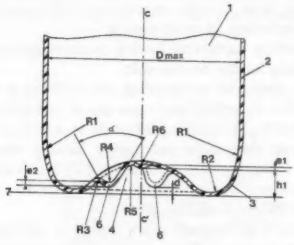
1. In a bottle made of saturated polyester resin having a neck and a trunk and formed by biaxial orientation of a parison of said saturated polyester resin, the improvement comprising a vertically extending, strip-shaped projection formed on the outer surface of said trunk by said biaxial orientation of (1) a strip-shaped piece welded on the outer surface of said parison and (2) said parison.

4,276,987

HOLLOW BODY MADE OF AN ORIENTED THERMOPLASTIC

Edmond Michel, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Jan. 18, 1980, Ser. No. 113,264
Claims priority, application France, Feb. 7, 1979, 79 03414
Int. Cl.³ B65D *1/02*
U.S. Cl. 215—1 C 13 Claims



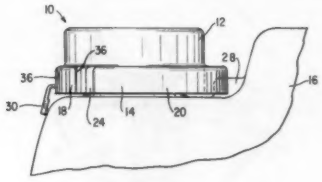
1. Hollow body made of an oriented thermoplastic, which has a longitudinal axis of symmetry and possesses a cylindrical neck, a side wall of general cylindrical shape and a base which comprises a central part in the form of an inset dome, which central part is joined to the side wall by means of an arched peripheral moulding forming a bearing surface for the hollow body in the vertical position, and is provided with a plurality of hollow protuberances which project outwards from the hollow body and are distributed about its longitudinal axis, characterised in that the protuberances have the appearance of cones with a rounded vertex and have tops which are separated from the longitudinal axis of the hollow body by a distance which is equal to at most 60% of the external diameter of the neck of the hollow body.

4,276,988

TAMPER-PROOF CLOSURE

Otfried Kimm; Theo Hammes, and Peter Loebler, all of Cologne, Fed. Rep. of Germany, assignors to Mauser-Werke GmbH, Brühl, Fed. Rep. of Germany

Filed Jan. 18, 1980, Ser. No. 113,274
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2901953
Int. Cl.³ B65D *41/62, 55/06*
U.S. Cl. 215—254 11 Claims



1. A tamper-proof closure for containers having a screw cap and a projection on the container, comprising:

a. a seal cap having a dimension and configuration adapted for receiving at least a portion of the screw cap therein;

b. a lock ring disposed about the seal cap at one end thereof, and characterized in that the lock ring has:

(1) a first portion integral with the seal cap;

(2) a second portion breakably attached to the seal cap;

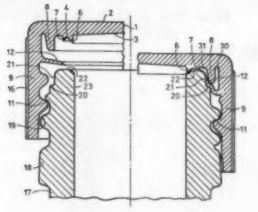
the first and second portions being separated at their respective ends by recesses, the projection being disposed within one of the recesses when the seal cap is installed on the screw cap such that when the screw cap is opened, the second portion is at least partially detached from the seal cap and thereby evidences tampering with the screw cap.

4,276,989

CLOSURES

David M. Hicks, 13 Janet St., East Keilor, 3033, Victoria, Australia

Filed Oct. 31, 1979, Ser. No. 89,893
Claims priority, application Australia, Nov. 6, 1978, PD6664
Int. Cl.³ B65D *53/00*
U.S. Cl. 215—270 9 Claims



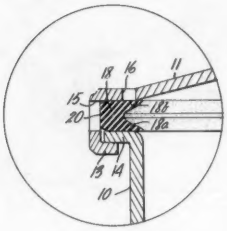
1. A closure comprising a top, a depending skirt, a first flange depending from the top and spaced from the skirt, and a resilient second flange on the depending skirt extending inwardly and which is deformable on moving the closure onto the finish of a container to conform against the outside side wall of the neck of the container and wherein said first flange is adapted to engage with said second flange to force said second flange into close conformity with the outside side wall or the top radius of the neck of the container.

4,276,990

PRESSURE COOKER WITH SEAL SAFETY RELIEF

Morvan Chiodo, Rua Dr. Berto Conde No. 321, Sao Paulo, Brazil

Continuation of Ser. No. 954,096, Oct. 24, 1978, abandoned.
This application Mar. 10, 1980, Ser. No. 128,409
Claims priority, application Brazil, Nov. 1, 1977, 5701390
Int. Cl.[3] B65D *51/16*
U.S. Cl. 220—209 1 Claim



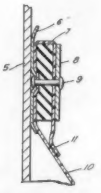
1. In combination, a container for containing therein contents capable of developing a vapor pressure, means for relieving a vapor pressure in said container comprising a cover for said container having a peripheral flange, said cover having at least one lateral through opening on said flange, a vent opening comprising a through opening on a top cover surface of said cover in a locality adjacent said lateral opening in the flange, a flexible seal providing a seal between the cover and the container and underlying said vent opening and effectively sealing said lateral through opening and said vent opening simultaneously when the cover is disposed on said container, said seal comprising a flexible material flexing into said lateral through opening in the flange when vapor pressure in said container exceeds a predetermined pressure, the lateral through opening in the flange being sufficiently large in a circumferential direction to allow a circumferential section of said seal to flex outwardly thereinto and uncover the vent opening and vent the container vapor upwardly when the seal has flexed sufficiently into said lateral through opening when the vapor pressure exceeds said predetermined pressure, and the seal material having memory and restoring inwardly to a position sealing said vent opening when the vapor pressure in said container is less than said predetermined pressure.

4,276,991

FLOATING ROOFS WITH MAGNETIC SEALS

Arnold Gunther, 29 Lorelei Rd., West Orange, N.J. 07052

Filed May 4, 1979, Ser. No. 36,378
Int. Cl.[3] B65D *88/44*
U.S. Cl. 220—223 1 Claim



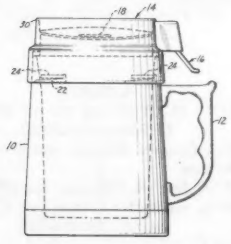
1. A magnetic seal for a floating roof steel tank in which a generally cylindrical tank is provided with a cylindrical floating roof therewithin of a diameter less than the inside diameter of the tank, the magnetic seal comprising a plurality of substantially narrow, flexible and permanently magnetized segments, the width of said segments being a fraction of the height of the floating roof, the totality of the segments covering substantially the inner circumference of said tank's shell, a ring-like shaped, flexible curtain with its outer circumferential portion attached to said plurality of magnetized segments and its inner circumferential portion attached to said floating roof, said permanently magnetized segments being composed of: a substantially thin and narrow metallic strip in sliding contact with the tank's shell, said metallic strip being substantially non-magnetic, a narrow and permanently magnetized flexible strip parallelly located to said non-magnetic metallic strip, a narrow and substantially thin metallic strip facing said magnetized strip, the said non-magnetic metallic strip, magnetized strip, metallic strip and outer circumferential portion of said curtain being held together by convenient fastening means, linkage means between said floating roof and said plurality of segments, said linkage means causing the segments to follow the vertical displacements of the floating roof.

4,276,992

DRINKING CUP WITH LATERALLY ACTUATED VALVE

Roland J. Susich, 3518 Bayberry La., Malibu, Calif. 90265

Filed Mar. 5, 1979, Ser. No. 17,494
Int. Cl.[3] A47G *19/22*
U.S. Cl. 220—254 4 Claims



1. A mug type drinking receptacle with cover and valve assembly, including, in combination:

(a) a drinking receptacle having an open top and laterally extending handle on one side;

(b) a flat plate and surrounding rim defining a cup-shaped cover for closing off said open top of said receptacle, said plate having an opening adjacent to a first point of said rim, said receptacle and cover having inter-engaging means for removably securing said cover to said receptacle in a position in which said opening is circumferentially spaced 90° from said handle;

(c) a valve head beneath said opening in said plate having resilient support means secured to the bottom surface of said plate biasing the valve head upwardly against the bottom periphery of said opening to normally close said opening; and

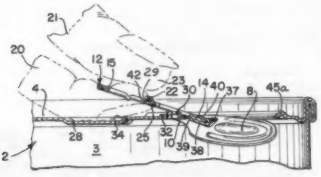
(d) an actuating member passing through a side opening in said rim beneath the undersurface of said plate at a point circumferentially spaced 90° from said opening so as to fall in vertical alignment with said handle, said member terminating in a camming surface engaging a portion of said valve head such that when said member is urged inwardly through said side opening in said rim, it cams said valve head away from said opening to thereby open the same so that a person can drink a beverage from said receptacle by holding said handle with one hand in the manner of a mug and operating said actuating member with the thumb.

4,276,993

EASY-OPENING CONTAINER WITH NON-DETACH TAB

Gary K. Hasegawa, Chicago, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Oct. 10, 1979, Ser. No. 83,450
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—269 10 Claims



1. An easy opening container having an end panel with a scored area defining a closure disk adapted to be severed from said panel and pushed into the container;

a tab having a nose portion at one end overlying said disk, an ear secured to said panel in an area spaced from said disk and a lift portion at the opposite end of the tab;

said lift portion having an aperture therein dimensioned to only admit the nodes of the user's finger grasping said lift portion; and

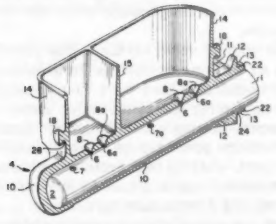
finger-placement-limiting means on the tab between said aperture and the area of securement of said tab to said end panel.

4,276,994

COMPOSITE POWER CYLINDER

George Spalding, Monroe City, Mo., assignor to Diemakers, Inc., Monroe City, Mo.

Continuation-in-part of Ser. No. 702,880, Jul. 6, 1976. This application Aug. 28, 1978, Ser. No. 937,405
Int. Cl.³ F15B *7/00*
U.S. Cl. 220—454 23 Claims



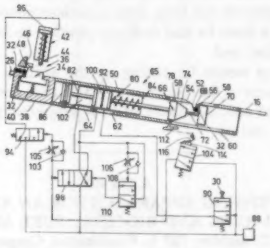
1. A composite hydraulic brake master cylinder comprising a preformed oversized tubular steel sleeve having a bore therein for at least one hydraulic piston, a metal die casting having a generally cylindrical configuration surrounding and concentric with said sleeve exerting a substantially uniform shrinkage force on the entire exterior cylindrical surface of said sleeve, said sleeve having an operating cylinder bore diameter sized by said shrinkage force of the casting placing the sleeve under predetermined compression, and said sleeve having an exterior surface with an end closure over which said casting extends and which is thereby encased by said casting.

4,276,995

GARMENT-HANGING STATION ON A CONVEYOR

Manfred A. Jennewein, Mörfelden-Walldorf, Fed. Rep. of Germany, assignor to Sussman Bügeltechnik GmbH, Walldorf, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 68,177
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836750
Int. Cl.³ B65G *47/06;* B65H *3/30*
U.S. Cl. 221—15 26 Claims



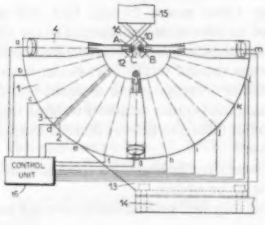
1. In an arrangement for the conveyance along a predetermined path of suspended elements which have objects, particularly of hangers which have garments, supported thereon for joint conveyance at least along a portion of the path, a combination comprising a support rail extending at least along a section of the path and supporting a portion of a suspended element; means for temporarily detaining the suspended element on said rail for handling of the respective object, including an abutment inclined relative to the path section, and means including a mobile latch for confining said portion of the suspended element between said rail, said abutment and said latch; means for releasing said portion of the suspended element from engagement with said abutment; and means for effecting relative movement between said portion of the suspended element, said abutment and said latch during detaining and releasing phases of operation.

4,276,996

DEVICE FOR FEEDING A WORK STATION WITH A SERIES OF ARTICLES, PARTICULARLY ELECTRIC WIRES, IN A PREDETERMINED ORDER

Serge Leandris, Saint Sauveur, France, assignor to Precision Mecanique Labinal, France

Filed Sep. 25, 1979, Ser. No. 78,799
Claims priority, application France, Sep. 28, 1978, 78 27855; Jan. 18, 1979, 79 01287
Int. Cl.³ B65G *61/00*
U.S. Cl. 221—87 20 Claims



1. A device for supplying a work station with a series of articles in a predetermined order, said device comprising:

n mobile article-holders adapted to receive articles fed to them, n being an even integer greater than 1;

n moving means each adapted to move a respective said

article-holder between a respective taking-up position and one of two delivery positions, said two delivery positions being in a predetermined zone; (n/2) of said article-holders being movable between their respective said taking-up positions and one of said delivery positions, and the remaining (n/2) said article-holders being movable between their respective said taking-up positions and the other said delivery position;

control means for actuating in a predetermined order each said moving means to move the corresponding said article-holder from its said taking-up position to its said delivery position and then, after a predetermined time, to move it back from its said delivery position to its said taking-up position; and

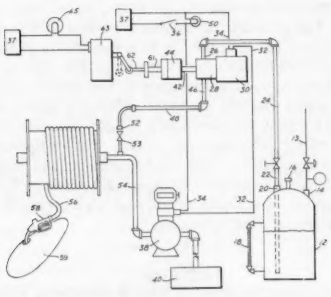
taking-up means for taking up the articles successively in said zone in the sequence in which they are moved thereto by said article-holders, and for supplying the articles to a work station.

4,276,997

DISPENSING APPARATUS FOR AN AIRCRAFT ANTI-ICING AND BIOCIDAL FUEL ADDITIVE

Theodore C. Ambler, 727 S. Washington, Casper, Wyo. 82601

Filed Aug. 3, 1978, Ser. No. 930,570
Int. Cl.[2] B67D *5/06*
U.S. Cl. 222—23 **4 Claims**



1. An additive metering and dispensing system including:

an additive storage tank, having inlet and outlet means, adapted to receive an additive under pressure;

a volume regulator, having inlet-outlet means, adapted to receive and dispense through said inlet-outlet means a selected variable measured amount of additive on each operation cycle and wherein the volume regulator has means for selectively varying the amount of additive during the operation cycle;

a three-way valve means having first and second outlet means and an inlet means connected to the outlet means of said storage tank adapted to selectively connect said first outlet means thereof to the inlet-outlet means of the volume regulator in response to a signal and to selectively connect said inlet-outlet means of volume regulator to said second outlet means to deliver thereto a measured amount of additive;

measuring means for measuring a fluid stream to which the additive is to be added;

means connecting said second outlet into the measured fluid stream;

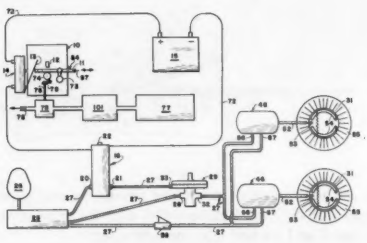
means for developing a signal in response to a predetermined measure of fluid by said measuring means and means for applying the developed signal to the three-way valve to deliver a measured amount of additive to the measured fluid stream in response to the measuring means passing a predetermined amount of fluid.

4,276,998

METER-CONTROLLED BRAKING SYSTEM FOR A FLUID-DELIVERING VEHICLE

Eugene L. Blackburn, 7136 Chamberlayne Rd., Mechanicsville, Va. 23111

Continuation-in-part of Ser. No. 16,667, Mar. 1, 1979, abandoned. This application Nov. 26, 1979, Ser. No. 97,244
Int. Cl.[3] B67D *5/24*
U.S. Cl. 222—30 **4 Claims**



1. In an automotive vehicle designed for the transportation and delivery of fluid fuel provided with an electrical system, a pedal-controlled service brake system utilizing pressurized air, and a recording meter assembly for recording the volume of fuel delivered from said vehicle, said assembly having a tray for supporting a sales slip, said tray being sequentially and cylically moveable between a first position wherein said assembly is not functionally disposed to properly record the volume of fuel delivered, and a second position wherein said assembly is functionally disposed to properly record the volume of fuel delivered, and means mechanically coupled to said tray for imprinting data on said sales slip corresponding to the status of said assembly prior to and subsequent to said delivery of fuel, an improved braking system comprising:

(a) an electric switch associated with said assembly in a manner adapted to establish a first mode of flow of electrical current in a circuit connected to said electrical system when said tray is in said first position, and adapted to establish a second mode of flow of electrical current in said circuit when said tray is in said second position,

(b) a solenoid-controlled valve electrically connected to said circuit and adapted to transmit air pressure from an upstream high pressure reservoir to downstream components when said circuit is in said second mode, and adapted to discontinue transmission of air pressure and to release downstream pressure when said circuit is in said first mode,

(c) an air control valve having a first chamber which receives air pressure transmitted from said solenoid valve and is bounded in part by a first pressure-displaceable diaphram having associated valve means, an upstream port communicating with said high pressure reservoir, and a downstream port adapted to transmit air from said upstream port, whereby high pressure within said first chamber causes said valve means to interrupt flow between upstream and downstream ports, and

(d) at least one pair of brake control assemblies, each of said assemblies being comprised of an outer housing confining a second chamber bounded in part by a second pressure-displaceable diaphram which engages a coiled power spring, and a third chamber bounded in part by a third pressure-displaceable diaphram which engages a push rod extending out of said housing and connected to means which apply braking action to a wheel of said vehicle when said push rod is displaced away from said housing, said second chamber communicating with the downstream port of said air control valve, said third chamber communicating with said pedal-controlled service brake system, and force transmitting means interactively dis-

posed between said second and third diaphrams, whereby high pressure air supplied to said second chamber causes said push rod to move into said housing and removal of said high pressure from said second chamber causes said push rod to be displaced away from said housing, the opposite responses of the push rod to pressure being produced by said third chamber.

4,276,999

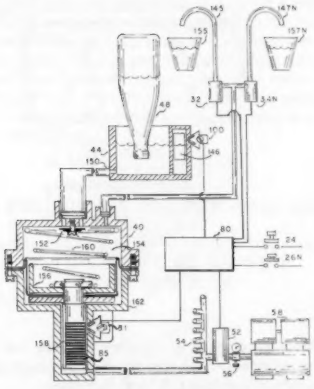
BEVERAGE DISPENSING SYSTEM

Arthur M. Reichenberger, 1916 N. 21st Pl., Phoenix, Ariz. 85006

Continuation-in-part of Ser. No. 767,772, Feb. 11, 1977, Pat. No. 4,162,028. This application Nov. 1, 1978, Ser. No. 956,439

Int. Cl.³ B67D *5/56*

U.S. Cl. 222—129.4 **4 Claims**



1. A beverage dispenser comprising:

(a) a dispenser handset;

(b) a plurality of liquid delivery conduits coupled to said dispenser handset for delivering liquid beverage ingredients thereto;

(c) a plurality of liquid delivery means, each coupled respectively to said delivery conduits;

(d) a plurality of liquid ingredient supplies, each coupled respectively with one of said delivery means;

(e) a plurality of electronic selection switches on said dispenser handset for sending electronic signals when actuated;

(f) a plurality of electronic signal generating means, each cooperating with one of said plurality of delivery means for generating volume related signals;

(g) an electronic control means coupled in circuit with said plurality of selection switches, said plurality of delivery means and said plurality of signal generating means and including driving means for energizing selected ones of said plurality of delivery means upon receiving an electronic signal from any of said plurality of selection switches; and

(h) stopping means for de-energizing said selected ones of said plurality of delivery means upon counting a preset number of said volume related signals from the respective said signal generating means.

4,277,000

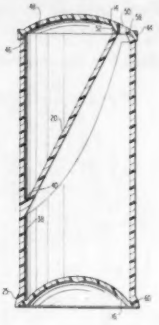
MULTI-COMPARTMENT CONTAINERS

Frank C. Jaarsma, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 17, 1979, Ser. No. 39,721

Int. Cl.³ B65D *1/04*; B43L *25/04*

U.S. Cl. 222—142.4 **11 Claims**



1. A multi-compartment container comprising:

a body portion formed of thermoplastic material and including a confining wall forming upper and lower ends and an inner space therewithin, a divider wall integrally formed with said confining wall and dividing said inner space into a plurality of compartments, and a separately formed base connected to said confining wall for closing off said lower end of said confining wall and forming a bottom for a first of said compartments;

said upper end of said confining wall forming a first continuous edge;

said divider wall intersecting an internal surface of said confining wall and including a second edge forming an opening adjacent an upper end of said body portion communicating with said first compartment, said opening disposed internally of said first edge,

a top portion formed of thermoplastic material and secured to said upper end of said confining wall to form a seal therearound, said top portion including

a third continuous edge overlying said first edge of said body portion and immovably fixed thereto,

a downwardly projecting collar forming a fourth edge overlying said second edge, said collar forming a first port communicating with said opening to form a passage therewith, and

endless resilient seal means disposed in one of said first second and fourth edges and engaging the other thereof in surrounding relationship to said passage to provide a seal between said compartments.

4,277,001

INVERTIBLE MINIATURE ATOMIZER OF MANUAL TYPE

Takamitsu Nozawa, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 707,006, Jul. 20, 1976, abandoned. This application Sep. 12, 1978, Ser. No. 941,619

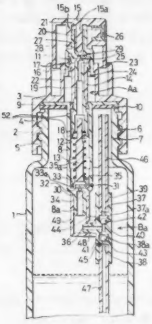
Claims priority, application Japan, Jul. 21, 1975, 50-100965[U]

Int. Cl.³ B05B *9/043*; G01F *11/36*

U.S. Cl. 222—321 **8 Claims**

1. A liquid spraying device comprising a container for liquid, including an axially perforated cap, spray means including a nozzle associated with said container and including reciprocable means extending through said cap, first pressure chamber means depending beneath said cap, said last named means including spaced upper and lower vent means, second pressure

chamber means in axial alignment with said first pressure chamber means and positioned above said cap, said reciprocable means including plural piston members having spaced upper and lower skirt means, the spaced upper and lower skirt means of the lower piston member are adapted to open and close said vent means and further including first valve means, said valve means being arranged to control liquid flow from said second pressure chamber means to the nozzle of said spray means, spring means arranged to maintain said first valve means in a closed condition to prevent inadvertent emission of



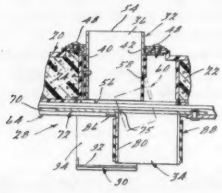
liquid therefrom, second valve means in said first pressure chamber means provided with a seat having a perforation and having an opening in non-aligned orientation with said perforation so as to permit passage of liquid from said container to said first pressure chamber means upon the application of said reciprocable means, liquid carrying means depending from said last-named means and extending into said container, further characterized by suction means including a three-way valve assembly being associated with the said first pressure chamber means.

4,277,002

ICE DISPENSING MECHANISM

Donald R. Christensen, and Ralph F. Stanford, both of Albert Lea, Minn., assignors to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Jul. 13, 1979, Ser. No. 57,315
Int. Cl.³ G01F *11/10*
U.S. Cl. 222—349 **21 Claims**



1. In combination in an ice dispensing machine including an ice storage area and means defining an ice transfer path having an ice inlet communicable with the ice storage area and an outlet from which ice may egress,

an ice dispensing assembly including first and second enclosure means,

said first enclosure means being communicable with the outlet of the ice transfer path and adapted to transfer ice to said second enclosure means,

means supporting said second enclosure means for generally horizontally slidable drawer-like reciprocal movement along a sliding axis between an ice receiving position whereby ice is transferred from said first enclosure means to said second enclosure means, and an ice dispensing position whereby the ice within said second enclosure means may be dispensed into a suitable ice receptacle, and

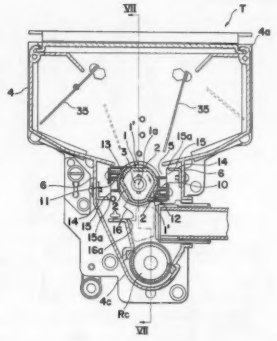
a generally vertically disposed deformable and compliant wall means on said second enclosure means arranged at generally right angles to said axis so as to be capable of deformably moving upon engagement with an ice article for preventing damage to said article and said assembly due to said ice article being dispensed thereby from becoming jammed or lodged therewithin as said second enclosure means is moved along said axis between said positions.

4,277,003

DEVELOPING MATERIAL SUPPLYING DEVICE

Kenji Tabuchi, Sakai, and Hidehito Iwata, Toyohashi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1979, Ser. No. 76,955
Claims priority, application Japan, Sep. 19, 1978, 53-129280[U]; Dec. 28, 1978, 53-180190[U]
Int. Cl.³ G01F *11/10*
U.S. Cl. 222—350 **7 Claims**



1. A developing material supplying device for supplying developing material to an electrostatic latent image developing apparatus, which supplying device comprises:

a developing material storage tank for accommodating therein developing material to be supplied and having a developing material supplying opening in the lower portion thereof;

a developing material supplying roller rotatably mounted in said developing material supplying opening of said developing material storage tank and having at least one recessed portion in the peripheral surface thereof for measuring the amount of the developing material to be supplied, said recessed portion extending along substantially the entire length of said supplying roller except for the opposite end portions of said supplying roller;

a regulating member for regulating the amount of developing material to be supplied by said supplying roller and being mounted at a position where said recessed portion of said supplying roller in said supplying opening moves from the interior to the exterior of said storage tank during rotation of said supplying roller, said regulating member having an arcuate surface which is opposed to the peripheral surface of said supplying roller and which has a radius of curvature approximately equal to that of said circumferential surface of said supplying roller and having a size sufficient for covering the entire portion of the peripheral surface of the recessed portion of said supplying roller and contacting the opposite end portions of said supplying roller, said regulating member being mounted for movement toward and away from said peripheral surface of said supplying roller around an axis of rotation, said regu-

lating member lying on the side of a line extending from the axis of rotation through the axis of rotation of said supplying roller, the regulating member being positioned on a side of the line in which the direction of rotation of said supplying roller is away from said line, and biasing means urging said regulating member toward said circumferential surface of said supplying roller with the portions of said regulating member contacting said end portions of said supplying roller contacting said end portions under pressure; and

a shield member being mounted at a position where said recessed portion of said supplying roller in said supplying opening moves from the exterior to the interior of said storage tank during rotation of said supplying roller, said shield member having an arcuate surface which is opposed to the peripheral surface of said supplying roller and which has a radius of curvature approximately equal to that of said circumferential surface of said supplying roller and having a size sufficient for covering the entire portion of the peripheral surface of the recessed portion of said supplying roller and contacting the opposite end portions of said supplying roller, said shield member being mounted for movement toward and away from said peripheral surface of said supplying roller around an axis of rotation, said shield member lying on the side of a line extending from the axis of rotation through the axis of rotation of said supplying roller, said shield member being positioned on the side of the line in which the direction of rotation of said supplying roller is away from said line, and biasing means urging said shield member toward said circumferential surface of said supplying roller with the portions of said shield member contacting said end portions of said supplying roller contacting said end portions under pressure.

4,277,004

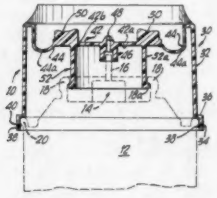
COVER AND AEROSOL ACTIVATOR FOR AEROSOL SPRAY CAN

John J. Barlics, 676 Denver Blvd., North Edison, N.J. 08817

Filed Oct. 15, 1979, Ser. No. 84,559

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—402.14 **19 Claims**



1. An integrated cap for an aerosol container, which container includes a top having an aerosol valve and an annular lip surrounding the aerosol valve, said cap comprising covering means for covering the aerosol valve of the container; positioning means formed integrally with said covering means for positioning said covering means above the aerosol valve of the container, said positioning means including connecting means for connecting said covering means to said positioning means such that said covering means is linearly movable relative to said positioning means towards the top of the container in a generally vertical direction, said connecting means including a first resilient member attached to said covering means on one side thereof and a second resilient member attached to said covering means on an opposite side thereof; activating means movable with said covering means and integral therewith for activating the aerosol valve of the container when said covering means is moved a predetermined distance towards the top of the container; and locking means movable with said covering means and integral therewith for automatically locking said covering means to the annular lip of the container when said covering means is moved said predetermined distance towards the top of the container, whereby the aerosol valve of the container is continuously activated by said activating means.

4,277,005

APPARATUS FOR FOLDING GARMENTS SUCH AS SHIRTS

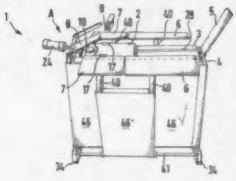
Peter Heap, Ashby de-la-Zouch, England, assignor to IROPA (Textile Accessories) Ltd., Leicester, England

Filed Jun. 11, 1979, Ser. No. 47,247

Claims priority, application United Kingdom, Jun. 15, 1978, 27013/78

Int. Cl.³ A41H *33/00*

U.S. Cl. 223—37 **9 Claims**



1. In an apparatus for folding a garment, such as a shirt, said apparatus including: a supporting plane for permitting a portion of the garment to be positioned thereon, the supporting plane having a collar expander associated therewith, a forming plate positionable over the supporting plane for permitting the garment to be folded thereabout, support means positioned adjacent one end of the supporting plane for supporting thereon the tail portion of the garment, means for moving the support means into a position wherein it overlies the forming plate for folding the tail portion of the garment over the forming plate so that the tail portion overlies the garment portion lying on the supporting plane, reciprocal means disposed adjacent the opposite sides of the forming plate for folding the side parts of the garment about lines which are substantially parallel to the longitudinal axis of the garment and are defined by the side edges of the forming plate, holding means movable into a position above said forming plate for holding the folded-over tail portion along a further folding line so that the free-end tail part of the folded-over tail portion is suspended downwardly from the holding means, and a device for tucking in the free-end tail part of the partially-folded garment about said further folding line so that said free-end tail part is inserted between the forming plate and the holding means, comprising the improvement wherein said device includes a tucking member mounted for tiltable movement between an upright position wherein it does not engage the partially-folded garment and a lowered position wherein it is disposed in a plane below the holding means for engaging the free-end tail part of the garment which is suspended downwardly from the holding means, said device also including means for moving the tucking member from said upright to said lowered position and then reciprocably moving the tucking member when in said lowered position in a direction substantially parallel to the longitudinal axis of the garment for causing the free-end tail part to be tucked beneath the holding means so as to be positioned between the latter and the forming plate.

4,277,006

ROLLER SKATE CARRIER

William A. Pinckard, Woodland Hills, Calif., assignor to Vicky England Pataick, Sepulveda, Calif., a part interest

Filed Nov. 19, 1979, Ser. No. 95,781

Int. Cl.³ B65D *71/00*

U.S. Cl. 294—145 **10 Claims**

1. A carrier for roller skates, said carrier including:

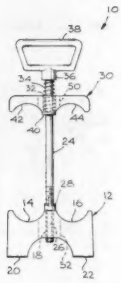
a threaded rod having first and second extremities;

a stand portion carried on said rod towards said first extremity of said rod and including adjusting means for adjustably supporting said stand portion on said rod;

a clamping portion carried towards the second extremity of said rod in slidable relation to said rod;

a handle carried at said second extremity of said rod and including a shoulder portion engaging said rod;

a spring having first and second ends, said first end forcefully engaging said shoulder portion and said second end forcefully engaging said clamping portion and urging it towards said stand portion;



stop means carried by said rod and engaging said clamping portion for limiting the movement of said clamping portion in the direction of said stand portion;

said clamping portion including arcuate, wheel-receiving recesses therein;

said stand portion including arcuate, wheel receiving recesses therein positioned, during use of said carrier, opposite respective recesses in said clamping portion; and,

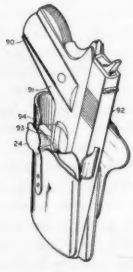
feet carried by said stand portion and integral with said stand portion.

4,277,007

FRONT OPENING HOLSTER FOR PISTOLS

John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Inc., Temecula, Calif.

Filed Feb. 12, 1979, Ser. No. 11,418
Int. Cl.[3] F41C *33/04*
U.S. Cl. 224—193 **19 Claims**



1. A front opening holster for use with handguns comprising:

a body of leather or leather-like material defining a weapon pouch and including portions defining a top opening for the insertion of a handgun into the holster and a front opening of sufficient length to allow the withdrawal of a handgun through the front opening;

resilient means biasing the front opening to substantially closed position and responsive to withdrawal forces applied to the handgun to allow the opening of the front opening and allowing the portions of a handgun contained within the holster to pass therethrough;

obstruction means secured to and mounted with respect to said body and positioned to enter the finger guard of the handgun when a handgun is located in its normal carrying condition within the holster;

said obstruction means being configured including a beveled surface on the upper side thereof whereby insertion of a handgun into the holster by the top opening allows the displacement of the obstruction means temporarily;

said obstruction means configured to substantially prevent the removal of a handgun through the top opening

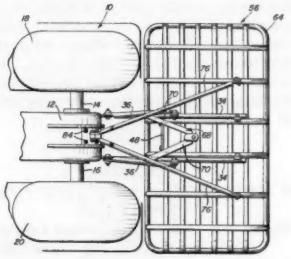
wherein said obstruction means includes a second beveled surface allowing the displacement of said obstruction means when handgun removal forces are applied to the handgun in the direction of the front opening of said holster.

4,277,008

MULTI-PURPOSE RACK AND HITCH FOR ATC

Donald J. McCleary, 733 E. McKinney, Neosho, Mo. 64850

Filed Sep. 17, 1979, Ser. No. 76,268
Int. Cl.[3] B60R *9/06*
U.S. Cl. 224—273 **11 Claims**



1. In combination with an all-terrain vehicle including lower and upper opposite side mounting portions, a tow hitch for said vehicle, said tow hitch including opposite side arm assemblies each having upper and lower support arms having front and rear ends, means attaching the front ends of said lower arms to said lower mounting portion and the front ends of said upper arms to said upper opposite side mounting portions, transverse bracing means extending between and connecting said arm assemblies adjacent the rear ends of at least one pair of corresponding upper and lower arms, a horizontally forwardly opening rigid V-shaped tow member including rearwardly convergent bars joined at their rear ends to define an apex, the forward ends of said bars being rigidly anchored to the rear ends of said one pair of arms, and said apex including means for attachment of a towed vehicle thereto.

4,277,009

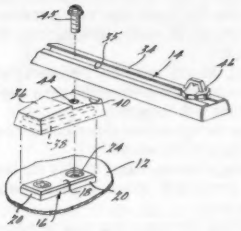
PERMANENT LUGGAGE CARRIER ADAPTERS WITH REMOVABLE PRIMARY LUGGAGE CARRIERS

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed May 15, 1979, Ser. No. 39,391
Int. Cl.[3] B60R *9/10*
U.S. Cl. 224—309 **9 Claims**

1. A luggage carrier mounted on a substantially horizontal surface of an automotive vehicle, said carrier comprising a plurality of four combination mounting and positioning elements disposed over said surface in four-corner areas thereof and permanently attached thereto, each of said elements being of a polygonal configuration and projecting above said surface and including a pair of openings for the reception of a pair of

blind fasteners, first fastening means securing each of said elements to one of each of said pair of blind fasteners associated therewith a luggage carrier system comprising four support members disposed one above each of said elements, each of said support members having an opening therein and a lower end portion, the underside of which is formed with a recess which is slightly larger than and of a generally complementary shape with respect to the shape of said elements so that when said support members are surmounted on said elements, said



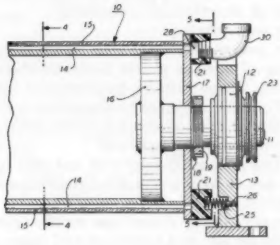
elements are substantially nestingly received within the recesses of said support members so that said support members are properly oriented upon the associated vehicle and so that said opening in each said support member is aligned with the other of said pair of blind fasteners associated with each of said elements, whereby cooperating second fastening means may extend through said openings in said supporting members and into said other of said pair of blind fasteners associated with each of said elements to removably secure said support members of said luggage carrier system to said vehicle.

4,277,010

VACUUM ROLLER FOR TRANSPORTING A WEB

Peter A. Landskroener, Bernardsville; John F. Dusenbery, Montclair, and Roger W. Young, Upper Montclair, all of N.J., assignors to John Dusenbery Company, Inc., Randolph, N.J.

Filed Apr. 10, 1980, Ser. No. 139,129
Int. Cl.³ B65H *17/30*
U.S. Cl. 226—95 **8 Claims**



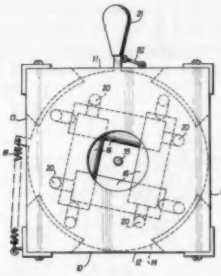
1. A roller for transporting a web by suction and comprising:
a. a cylindrical member mounted for axial rotation,
b. a plurality of spaced longitudinally-extending channels formed in the peripheral surface of said cylindrical member,
c. bars of air permeable material positioned in said channels, each bar having an inner surface spaced from the bottom wall of the associated channel and an arcuate outer surface lying on the outside diameter of said cylindrical member, and
d. means for controlling the air pressure in selected channels.

4,277,011

QUICK ADJUSTING ELONGATED OBJECT GUIDE

David R. Jeter, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Dec. 14, 1979, Ser. No. 103,754
Int. Cl.³ B65H *23/32*
U.S. Cl. 226—199 **11 Claims**



1. An apparatus for guiding various sizes of elongated objects through a predetermined path comprising:
a rigid frame;
a disc rotatably secured to the front of said frame and adapted to allow the continuous passage of an elongated object therethrough;
a rear plate adapted to allow the continuous passage of an elongated object therethrough secured to said frame parallel to and behind said disc, said disc and said rear plate being linearly arranged to form a predetermined elongated object path having a variable diameter and a non-variable longitudinal axis and so arranged whereby the longitudinal axis of said elongated object path is coincident with a line drawn perpendicular to said disc and said rear plate and longitudinally through the centers of said disc and said rear plate; and
at least three elongated object guide rollers of equal radius, said elongated object guide rollers being symmetrically spaced about and equidistant from the longitudinal axis of said elongated object path, movably secured to said disc by a sliding means and pivotally secured to said rear plate by a pivoting means whereby an elongated object passing along said predetermined path is compelled to pass along that portion of said predetermined path which is substantially equivalent to the longitudinal axis thereof.

4,277,012

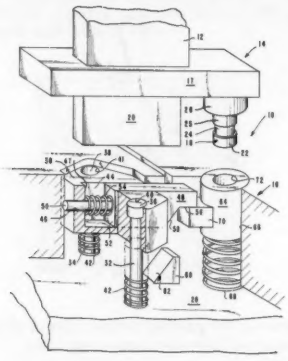
APPARATUS FOR INSTALLING A FERRULE

Robert R. Mercer, Ortonville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 954,751, Oct. 26, 1978, Pat. No. 4,227,294.
This application Feb. 8, 1980, Ser. No. 119,647
Int. Cl.³ A43D *69/00*
U.S. Cl. 227—68 **3 Claims**

2. A die set for sequentially cutting out an area of a panel and fastening a reinforcing member having a plurality of fastening portions in the cut out comprising: a male die; a female die; a female die housing; a spring continually biasing said female die upwardly in said housing; a latching lug on said female die; detent means in said female die housing releasably actuated to latch and unlatch said female die in relation to the force of its biasing spring; means movable with said male die engaging said female die and moving it against its biasing spring compressing the spring as said male die is moved into said female die; means on said female die engaging said means movable with said male die unlatching said detent from said female die permitting its biasing spring to rapidly move said female die upwardly when said male die has moved into said female die a predetermined

distance; and means on said male die receiving and supporting a reinforcing member to be installed in said panel; movement of one of said dies towards the other engaging said male die with said female die cutting out an area of a panel placed on said female die and moving the fastening portions of said reinforcing member into the cut out; further movement of the die into the female die expanding the fastening means on the underneath side of the panel while said means movable with said male die compresses said female die biasing spring; the extreme movement of said male die within said female die engaging said unlatching means releasing said detent from said female die permitting its biasing spring to rapidly move said female die upwardly clenching said fastening portions against the underneath side of said panel securing said reinforcing member in said panel cut out.

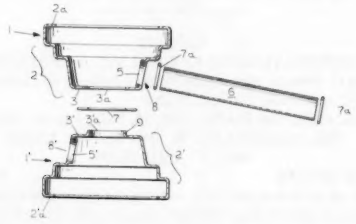


4,277,013

METHOD FOR BRAZE-ASSEMBLING METAL COMPONENTS HAVING LOW SOFTENING TEMPERATURES, WITHOUT DISRUPTING REGIONS OF STABILIZED DIMENSIONS

Louis Spanoudis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 17, 1979, Ser. No. 67,638
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—136 **3 Claims**



3. A method of braze-assembling a plurality of composite units, each unit comprising a pair of cups disposed in back to back relationship, each cup having a side wall aperture, and a connector tube inserted in a side wall aperture of one of the cups, said cups and tubes being formed of a metal having a low softening temperature and said cups having regions thereof requiring stabilized dimensions, said method comprising the steps of:

(1) mechanically joining the cups in back to back relationship with a preform of brazing material disposed therebetween, inserting a tube in the side wall aperture of one cup together with a preform brazing material, thus forming a mechanically assembled unit;

(2) positioning a plurality of said units in aligned lower heat sink members with the stabilized dimensional regions of the lower cup disposed in the heat sink and the free end of the tube of each unit engaging the side wall aperture of the lower cup of the adjacent unit;

(3) placing upper heat sink members around the stabilized dimensional regions of each of the upper cups;

(4) directing a brazing flame to only the braze juncture areas in the upper cups to obtain brazed joints;

(5) removing the upper heat sink members;

(6) removing the assembly of units from the lower heat sink members;

(7) rotating the unit assembly 180° about its longitudinal axis and reinserting the previously upper cup members into the lower heat sink members;

(8) placing the upper heat sink members onto the previously lower cups of the assembly;

(9) directing a brazing flame to only the braze juncture areas in the previously lower cups to obtain brazed joints therein, and

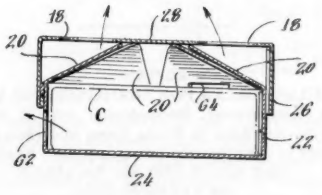
(10) removing the upper heat sink members from the assembly and removing the assembly from the lower heat sink members.

4,277,014

AIR FRESHENER

George Webinger, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Dec. 12, 1979, Ser. No. 102,898
Int. Cl.³ B65D *5/32, 5/38*
U.S. Cl. 229—11 **14 Claims**



1. A carton having selectively openable openings to control the flow of air therethrough comprising:

an upper unit including

a regular, polygonally-shaped top wall portion and

a plurality of sidewall panels connected thereto extending downwardly substantially perpendicular from each edge of said regular, polygonally-shaped top wall portion,

said top wall portion of said upper unit including a plurality of openings therethrough, and

a lower unit adapted to mate with and slide relative to said upper unit along a common longitudinal axis, said lower unit including

a regular, polygonally-shaped base member complemental in shape to the top wall portion of said upper unit, and

a plurality of sidewall panels extending upwardly from each edge of said regular polygonally-shaped base member substantially perpendicular thereto, the sidewall panels of said upper unit overlying the sidewall panels of said lower unit, and slidable relative thereto, and

a finger member extending substantially parallel to said base member connected to the upper edge of each of said sidewall panels of said lower unit in spaced relation to each other, each of said finger members being adapted to selectively close one of said openings in said upper unit by being positioned therebeneath, and

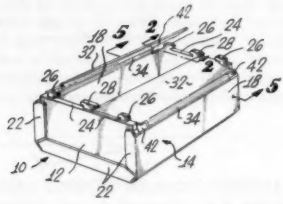
means on said upper and lower units for precluding their separation in a direction along said longitudinal axis.

4,277,015

CONTAINER FOR PRODUCE AND THE LIKE HAVING RELEASABLY SECURABLE FLAPS

Walton B. Crane, Sherman Oaks, Calif., assignor to Industrial Designs & Services, Encino, Calif.

Filed Nov. 7, 1979, Ser. No. 92,230
Int. Cl.³ B65D *5/02, 85/34*
U.S. Cl. 229—23 C **16 Claims**



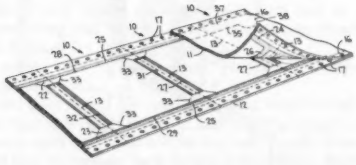
1. A container for produce or the like comprising:
a floor panel;
a pair of sidewalls;
at least one cover flap movable between open and closed positions and having at least one end tab;
a pair of endwalls to which said floor panel and said sidewalls are attached, at least one of said endwalls having a recess on a top surface thereof to receive said tab when said flap is in said closed position, said recess including an undercut portion adapted to interlock with said tab and prevent said flap from moving toward said open position; and
a joiner strip bendably connected to one of said sidewalls along one edge thereof and bendably connected to said flap along an opposite edge thereof, whereby said joiner strip permits both lateral and pivotal movement of said flap to engage and disengage said tab from said undercut portion.

4,277,016

ENVELOPE ASSEMBLY

William R. Wakeman; Edmund G. Van Malderghem, and Kenneth R. Greulich, all of Niagara County, N.Y., assignors to Moore Business Forms, Grand Island, N.Y.

Division of Ser. No. 895,451, Apr. 11, 1978. This application Aug. 31, 1979, Ser. No. 71,490
Int. Cl.³ B65D *27/10*
U.S. Cl. 229—69 **2 Claims**



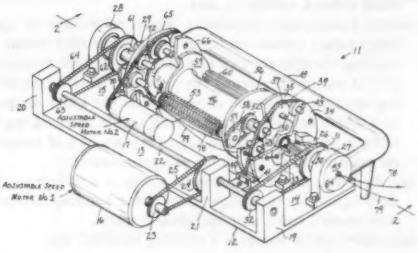
1. An assembly of stuffed, sealed envelopes, comprising, superimposed upper, intermediate and lower continuous plies respectively defining envelope fronts, inserts and envelope backs series-connected together along spaced cross lines of weakening in said plies, said intermediate ply having diecuts at said lines of weakening so as to define opposed side edges of said inserts spaced inwardly of said lines of weakening and initially defining connecting portions between said inserts, opposed end edges of said intermediate ply lying inwardly of opposed end edges of said upper and lower plies, first and second sealing means of like material in confronting relationship on said front and back plies, said material being characterized so as to adhere only to itself upon said first and second means contacting one another, said connecting portions being severed from said inserts by cuts extending through one of said upper and lower plies so as to completely free said inserts from attachment to one another, said material lying both outwardly and inwardly of said side and end edges, said material which lies outwardly of said edges adhering to itself for securing said fronts and backs together to form envelope pockets for said inserts, said material contacting said inserts without being attached thereto for snugly holding said inserts in place without shifting between said fronts and backs while said envelopes are series-connected together as well as after said envelopes are detached from one another, and means on said fronts and backs for opening the envelope pockets and extracting said inserts.

4,277,017

GEAR DRIVE FOR SEAL-LESS COUNTER CURRENT CHROMATOGRAPHY

Stephen B. Leighton, Silver Spring, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Oct. 11, 1979, Ser. No. 83,829
Int. Cl.³ B04B *9/00, 11/00*
U.S. Cl. 233—25 **12 Claims**

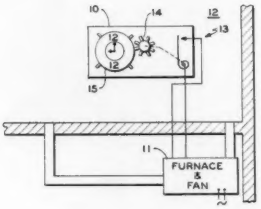


1. A flow-through coil planet centrifuge comprising a support, bearing means on the support defining a main rotational axis, two spaced spider structures journalled on said bearing means, spool means rotatably mounted between said spider structures for rotation on said axis, coiled centrifuge column means rotatably mounted on said spool means for rotation on a column axis spaced from and parallel to said main axis, a first independent stationary motor, means drivingly coupling said first motor to said two spider structures for simultaneous rotation thereof, fixed guide means on the support, inlet and outlet fluid conduit means connected to and in fluid communication with said column means and extending through said fixed guide means, column-rotating gearing means drivingly coupling a first one of said spider structures to said column means to rotate said column means responsive to rotation of said first spider structure, a second independent stationary motor, spool-rotating gearing means on the other spider structure, and means drivingly coupling said second motor to said spool-rotating gearing means to drive the spool means independently of the first motor.

4,277,018
CLOCK THERMOSTAT APPARATUS FOR RESETTING THE TEMPERATURE OF A SPACE DURING SELECTED TIME PERIODS WITH MEANS FOR VARYING THE PICKUP TIME AS A FUNCTION OF THE DROP IN SPACE TEMPERATURE DURING THE SETBACK PERIOD

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 11, 1979, Ser. No. 83,914
Int. Cl.³ F23N *5/20*
U.S. Cl. 236—46 R **1 Claim**



1. In a time controlled thermostat apparatus for providing a normal operation and no operation during a setback time period comprising,

first temperature responsive switch means adapted for controlling the operation of a temperature conditioning apparatus for maintaining a predetermined normal temperature in a space,

time controlled means connected to said temperature responsive switch means terminating the operation of the temperature conditioning apparatus for a predetermined time period and then restoring the operation for a temperature setback operation, and

second temperature responsive means responsive to space temperature connected to said time controlled means for varying the operation of said first temperature responsive switch means for starting the operation of said conditioning apparatus at a time depending on the space temperature which drops from said normal temperature during the setback time period when the operation of said temperature conditioning apparatus was terminated,

said first temperature responsive means is a switch mechanism having an operation position for a normal temperature control and a non-operation position,

said time control means is a rotating member, and

said second temperature responsive means is a member mounted on said rotating member having a stepped member for engaging said first temperature responsive means to move it from a non-operating position to an operating position.

4,277,019
ELECTRICALLY-CONTROLLED DAMPER

James S. Shreve, 10027 Black Ct., Fairfax, Va. 22032

Filed May 12, 1980, Ser. No. 148,652
Int. Cl.³ F24F *7/06*
U.S. Cl. 236—49 **8 Claims**

1. Temperature control system comprising,

at least two conduits for carrying flow of thermally conditioned fluid to a corresponding number of zones;

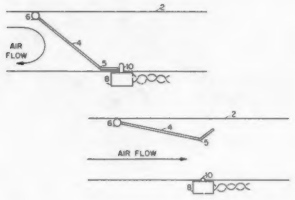
closure means in each conduit for selectively blocking off flow in each respective conduit or allowing flow therethrough, said closure means being freely movable in said conduit;

securing means for selectively maintaining said closure means in closed condition or allowing said closure means to open in response to flow through said conduit;

thermostat means associated with each said zone for sensing temperature within said respective zones; and

conditioning means to thermally condition fluid to be fed to said conduits;

wherein said thermostat means are operatively connected with respective ones of said securing means for each said



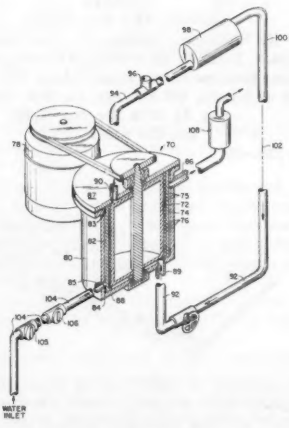
zone, and all of said thermostats are operatively connected with said conditioning means,

whereby each said thermostat controls the flow of fluid to its respective zone by simultaneously opening the respective closure means and causing operation of said conditioning means.

4,277,020
FLUID FRICTION HEATER

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Rutland, Mass.

Filed Apr. 30, 1979, Ser. No. 34,828
Int. Cl.³ F24C *9/00*
U.S. Cl. 237—1 R **19 Claims**



1. A fluid friction heater comprising:

a housing having a cylindrical inner surface with at least nearly circumferentially directed, closely spaced grooves formed therein, the depth of said grooves being small relative to the diameter of the cylindrical inner surface;

means for supplying a liquid to the housing at one end and exhausting the liquid from the housing at the other end;

a drum mounted within the housing and having a cylindrical outer surface in close proximity to the cylindrical inner surface of the housing to define a narrow annular space

through which the fluid flows through the housing, said cylindrical outer surface having a plurality of at least nearly circumferentially directed, closely spaced grooves formed therein, said grooves being small relative to the diameter of the cylindrical outer surface, the pitch of the grooves in said inner surface being different from the pitch of the grooves in said outer surface; and

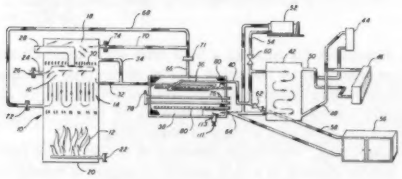
means for rotating the drum so that the pitch of the grooves in the drum relative to the pitch of the grooves in the housing tends to advance the liquid through the housing from its inlet end to its outlet end, the rotation of the cylindrical outer surface of the drum and the cylindrical inner surface of the housing subjecting the liquid to agitation and shearing action which heats the liquid as it passes through the annular space between the housing and the drum.

4,277,021

CLOSED CIRCUIT HEATING SYSTEM

Leslie G. Daye, P.O. Box 11, Depauville, N.Y. 13632

Filed Sep. 7, 1979, Ser. No. 73,263
Int. Cl.³ F24D *3/00*
U.S. Cl. 237—56 **11 Claims**



1. A heating system comprising:

(a) a fuel-burning furnace having at least one outlet for a supply of air heated by-products of combustion therein:

(b) a heat storage chamber including an enclosure containing a heat absorbing and retaining material with substantial surrounding air space;

(c) first duct means conducting said supply of air from said furnace to and through said heat storage chamber for mutual heat exchange between said air and said material;

(d) an air-to-water heat exchanger positioned exteriorly of said heat storage chamber wherein heat from said air is transferred to water passing through said exchanger;

(e) at least one space heating means through which water flows to give up heat to room air, said water flowing in a continuous path between said exchanger and said space heating means;

(f) second duct means conducting air from said air space surrounding said material in said heat storage chamber to said furnace for re-heating therein;

(g) a smoke pipe for venting said products of combustion from said furnace;

(h) third duct means for conducting said supply of air from said heat storage chamber to said heat exchanger; and

(i) fourth duct means for conducting said supply of air from said heat exchanger back to said heat storage chamber.

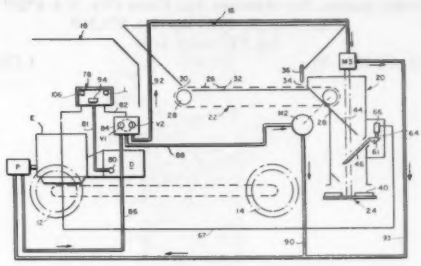
4,277,022

MOBILE MATERIAL DISTRIBUTION SYSTEM

Dennis W. Holdsworth, 33 Old Farm Rd., Dover, Mass. 02030, and Ernst Adler, Chestnut Hill, Mass., assignors to Dennis W. Holdsworth, Dover, Mass.

Continuation of Ser. No. 788,891, Apr. 19, 1977, abandoned.
This application Dec. 14, 1978, Ser. No. 969,469
Int. Cl.³ G01F *1/05;* A01C *17/00*
U.S. Cl. 239—7 **31 Claims**

20. The method of distributing material in an uniformly thick layer comprising gravitationally depositing the material onto the surface of a motor-driven conveyor, receiving the material from the discharge end of the conveyor and applying it on a downwardly inclined plate such that it slides gravitationally downwardly thereon onto a distributor, sensing only the dead weight of the mass flowing on the downwardly inclined plate and hence the rate of mass flow at any given instant substantially independent of the impact forces of said material received on said downwardly inclined plate and sending a signal proportional to said dead weight to the motor-driven conveyor to change its speed in a manner to maintain a controlled rate of mass flow of material.

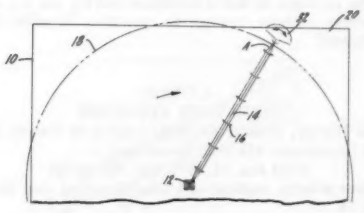


4,277,023

CENTER PIVOT IRRIGATION SYSTEM WITH CORNER WATERING ARRANGEMENT

John L. Anderson, Columbus, Nebr.; John C. Davidson, Alexandria, Minn.; Henry W. Schaaf, Madison, and Charles H. Meis, Genoa, both of Nebr., assignors to Lindsay Manufacturing Company, Lindsay, Nebr.

Filed May 27, 1977, Ser. No. 801,099
Int. Cl.³ B05B *3/12*
U.S. Cl. 239—11 **11 Claims**



1. A method of operating a center pivot irrigation system which is constructed for irrigating a main circular area of a field and noncircular areas outside of the main circular area in which the system includes a string of pipe supported at intervals on movable towers and extending outwardly from and adapted to move around a center pivot with a series of sprinkler units on the pipe string with a normal end gun on the outer end of the pipe string to irrigate limited areas outside of the noncircular area and an enlarged end gun on the outer end of the pipe string directed generally radially outwardly therefrom to irrigate substantially larger portions of the noncircular areas, including the steps of moving the pipe string around the main circular area and operating the series of sprinkler units thereon to irrigate the main circular area in the normal manner, at the same time periodically operating the normal end gun opposite the noncircular areas to irrigate limited areas outside of the main circular area in the noncircular areas, and, from time to time, deenergizing the series of sprinkler units on the pipe string and energizing the enlarged end gun for a certain limited extent of movement of the pipe string opposite a noncircular area so that the full water pressure of the system is

applied to the enlarged end gun during such limited extent of movement.

4,277,024

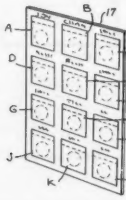
SELF-STICK AROMA-DISPENSING TAB

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Dec. 20, 1978, Ser. No. 971,380

Int. Cl.³ A61L *9/04*

U.S. Cl. 239—36 **1 Claim**



1. A perfume sampler constituted by a card having an array of individually removable, hermetically-sealed, rupturable metal foil plastic laminate packages thereon having a rectangular form and separate from each other, each housing an aroma-dispensing button-shaped tab that is removable from the ruptured package and is stickable onto any surface, each of said tabs comprising:

A. a sac of synthetic plastic material non-reactive with liquid perfume and formed by a base having a perforated dome marginally secured thereto to define a vented chamber, said base having a pressure-sensitive adhesive layer on its underside covered by a peel-off sheet; and

B. an absorbent pad disposed in said chamber saturated with a liquid perfume scent to exude a desired aroma through the perforated dome when the tab is removed from its hermetically-sealed package, the pads in the array of packages having different scents which are identified on the packages so that a consumer can try out the various scents without having to purchase separate bottles thereof.

4,277,025

VIBRATORY ATOMIZER

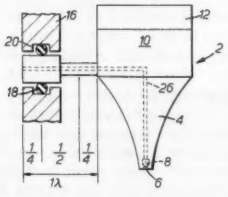
Dennis Harvey, Tilbury, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 21, 1979, Ser. No. 50,604

Claims priority, application United Kingdom, Jun. 29, 1978, 28332/78

Int. Cl.³ B05B *3/14*

U.S. Cl. 239—102 **9 Claims**



1. A vibratory atomizer for atomizing a liquid, which atomiser comprises a nozzle portion from which the liquid is ejected, a body portion having a longitudinal direction and a radial direction, means for vibrating said body portion in said longitudinal direction with a specified longitudinal vibration frequency and wavelength causing radial vibrations to be transmitted, and a liquid inlet pipe attached to the body portion at a nodal plane of the longitudinal vibrations and extending in said radial direction from the body portion by a length equal to an integral number of vibration half wavelengths which causes the pipe to resonate when it receives any of said radial vibrations generated by said means for vibrating said body portion, wherein, in use, energy passing into the pipe from said body portion reflects back into the body portion in phase with the vibrations thereof.

4,277,026

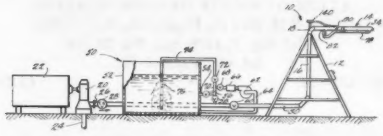
LIQUID CHEMICAL SPRAYING APPARATUS MOVABLE BY A TOWER-TYPE WATER IRRIGATION SYSTEM

Peter M. Garvey, Rte. 1, Box 186, Lenox, Ga. 31637

Filed Feb. 20, 1980, Ser. No. 123,769

Int. Cl.³ B05B *9/00*

U.S. Cl. 239—127 **14 Claims**



1. Apparatus for treating a field crop with liquid chemical for use with a water irrigation system of the type including a plurality of longitudinally spaced towers, and means for intermittently moving each of said towers to move the system through the field, said apparatus comprising:

means for applying liquid chemical to the field crop canopy and/or ground in a first pattern arranged to extend from one of said towers a majority of the distance toward an adjacent tower in amounts which diminish in a direction away from said one tower,

means for communicating liquid chemical under pressure with said first pattern applying means only when said one tower is in motion,

means for applying liquid chemical to the field crop canopy and/or ground in a second pattern arranged to extend from said adjacent tower for a majority of the distance toward said one tower in amounts which diminish in a direction away from said adjacent tower, and

means for communicating liquid chemical under pressure with said second pattern applying means only when said adjacent tower is in motion.

12. Apparatus for treating a field crop with liquid chemical comprising: a pivot move water irrigation system of the type including a stationary structure providing a swivel fitting movable about a fixed vertical axis, a power driven water pump for drawing water from a supply and delivering the same under pressure, a main conduuit having one end connected with said swivel fitting and a plurality of water sprinkler heads thereon, a plurality of longitudinally spaced towers movingly supporting said main conduit and sprinkler heads, and means for intermittently moving each of said towers to move the main conduit and sprinkler heads thereon through the field about the axis of said swivel fitting, a liquid chemical supply tank for containing a supply of liquid chemical, a power driven liquid chemical pump for drawing liquid chemical from said liquid chemical supply tank and delivering the same under pressure and a liquid chemical supply line extending generally parallel with said main conduit, liquid chemical applying means communicating with said liquid chemical supply line, input valve means upstream from said fitting for selectively communicating liquid chemical under pressure delivered by said liquid chemical pump or water under pressure delivered by said liquid water pump with the upstream side of said swivel fitting, and output valve means downstream from said swivel fitting for (1) communicating said liquid chemical supply line with the downstream side of said swivel fitting and closing off commu-

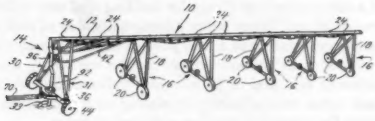
nication of said main conduit means therewith when said input valve means is operable to communicate liquid chemical under pressure with the upstream side of said swivel fitting and (2) communicating the main conduit means with the downstream side of said swivel fitting and closing off communication of said liquid chemical supply line therewith when said input valve means is operable to communicate water under pressure with the upstream side of said swivel fitting.

4,277,027

TOWABLE CENTER-PIVOT IRRIGATION SYSTEM

Owen W. Sherwin, Omaha, Nebr., assignor to Valmont Industries, Inc., Valley, Nebr.

Filed Jun. 7, 1979, Ser. No. 46,336
Int. Cl.³ B05B *3/00*
U.S. Cl. 239—177 **8 Claims**



1. A towable center-pivot irrigation system having a liquid conduit communicating with a liquid source and extending generally radially from a central pivot location, the conduit being supported along its length by spaced support towers movable is generally circular paths about the pivot location, a plurality of liquid dispensers spaced along the conduit for dispensing liquid fed through the conduit onto the field to be irrigated, a pivot assembly for pivotally locating said system and supporting said conduit at the pivot location, said pivot assembly further comprising a structural assembly supporting the end of the conduit near the pivot location above the ground, the structural assembly being supported on a plurality of circumferentially spaced wheels which turn in a generally circular path about the pivot location as the system operates in irrigating the field, the conduit at the pivot location having a generally downwardly extending portion, and a sleeve slidingly engaged with the generally downwardly extending portion of the conduit to slide axially relative thereto, the lower end of said sleeve being engaged with the ground in a lowered position for operation of the system and disengaged with the ground in a raised position for towing the system.

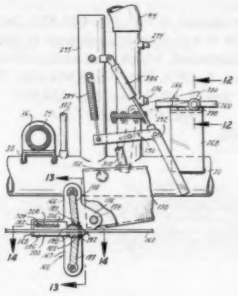
4,277,028

IRRIGATION SYSTEM AND DRIVE UNIT THEREFOR

Dale E. Olson, Fremont, Nebr., assignor to Valmont Industries, Inc., Valley, Nebr.

Filed Dec. 20, 1976, Ser. No. 752,318
Int. Cl.³ B05B *3/18*
U.S. Cl. 239—184 **5 Claims**

5. In an irrigation system for irrigating an area of a field which irrigation system includes a liquid conduit supported by wheels extending over a portion of said area to be irrigated, a drive unit for supplying liquid to said conduit and for rotating said conduit and wheels, said drive unit comprising means allowing movement of said drive unit along a path, means rotatably mounting said conduit to said drive unit for rotation about a generally horizontal axis generally normal to the path of the drive unit, means for rotating said conduit, a reciprocating cable gripping means for engagement with a fixed cable extending along said path, means for reciprocating said cable gripping means to move said drive unit along said cable, and control means for controlling the relative speed of reciprocation of said cable gripping means and the conduit drive means



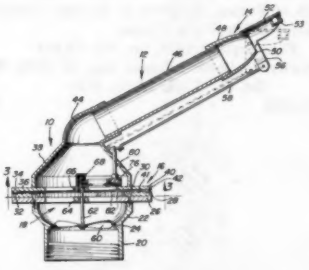
in response to relative fore and aft displacement of said drive unit and said conduit.

4,277,029

IRRIGATION SPRINKLER

Benjamin F. Rabitsch, P.O. Box 1062, Millen, Ga. 30442

Filed Dec. 3, 1979, Ser. No. 100,692
Int. Cl.³ B05B *3/04, 3/08*
U.S. Cl. 239—232 **8 Claims**

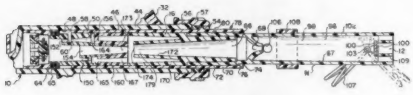


1. An irrigation sprinkler comprising a discharge nozzle for discharging water at a substantially constant volume and velocity, means rotatably supporting said nozzle for movement about a vertical axis with the nozzle discharging water in a lateral path, and drive means rotating said nozzle at varying rotational speeds in each cycle of rotation for varying the quantity of water discharged along radial land areas extending from the axis of rotation as the length of the radial land areas varies when irrigating a non-circular land area, said nozzle including movable diffuser means, said diffuser means including an actuating mechanism drivingly connected with the drive means for the nozzle to vary the radial length of discharge of water corresponding to the rotational speed of the nozzle with the greatest radial length of discharge occurring when the nozzle is travelling at its slowest rotational speed.

4,277,030
SPRAY AND FOAM DISPENSING NOZZLE

Valentine Hechler, IV, 26 Meadow View Rd., Northfield, Ill. 60093

Continuation-in-part of Ser. No. 651,521, Jan. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,800, Oct. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 520,676, Nov. 4, 1974, Pat. No. 3,984,053. This application Sep. 1, 1978, Ser. No. 938,897
Int. Cl.³ B05B 7/04
U.S. Cl. 239—407 23 Claims



7. Nozzle means having an elongated wall defining a compartment receiving a jet pressure inlet nozzle at its upstream end for liquid mixture under pressure and opening directly to atmosphere at its downstream end through a discharge opening many times greater in size than said jet inlet nozzle and disposed substantially coaxially in alignment therewith,

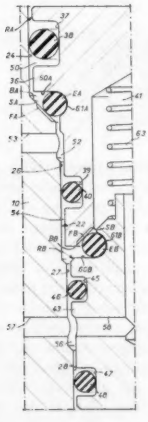
splash target means at least twice the area size of said inlet nozzle supported proximate to said discharge opening for movement into and out of alignment with said discharge opening, wherein the position of said splash target means relative to said discharge opening may be selectively varied within a range from a position substantially perpendicular to the flow of fluid through said nozzle means to a position substantially parallel to said fluid flow,

said jet inlet nozzle initially ejecting the mixture with jet flow energy as a jet stream flow directly against said wall and said target means causing it to splash laterally against said wall and ingest air in said compartment for final turbulent mixture discharge through said opening.

4,277,031
DUAL GAS SUPPLY BLOW TORCH

Francis Moumaneix, Le Raincy, and Cesar Marietta, St Leu la Foret, both of France, assignors to Anciens Etablissements Leon Guilbert & Fils, Paris, France

Filed Sep. 27, 1979, Ser. No. 79,454
Claims priority, application France, Sep. 29, 1978, 78 27934
Int. Cl.³ F16K 11/18, 7/20
U.S. Cl. 239—414 7 Claims

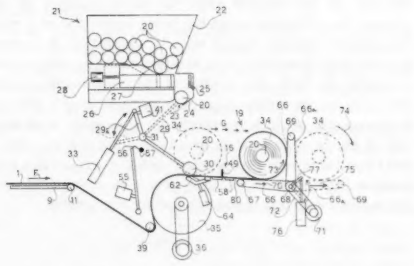


1. A blow torch having a dual gas supply one of which is a fuel gas and the other of which is a combustion supporting gas, comprising a body having a first inlet connection for a first gas, a second inlet connection for a second gas, an outlet connection for supplying a lance with a mixture of the two gases, a first duct extending between the first inlet connection and the outlet connection and comprising a first valve means, and a second duct extending between the second inlet connection and the outlet connection and comprising a second valve means, a single control for the total flow rate of the mixture of the two gases common to the first and second valve means and adapted to act simultaneously on the first and second valve means, each of said valve means comprising a bore member and a core member, each of said bore members and its associated core member having opposed transverse annular zones, said core member being displaceable in its associated bore member between open and closed positions, said annular zone of a first of said members having an annular elastic seal, while said annular zone of a second of said members forms a seat for said seal, supporting means including a radial shoulder for holding said seal on said first member axially opposite to said seat and a circumferential flange for holding said seal radially, the diameter of said flange being substantially that of said seal in its undeformed state, and a feed passage in each of said valve means with a cross section which can be varied by elastic deformation of said seal of its associate valve means, at least one of said valve means having regulating means for metering the relative flow rates of the first and second gases.

4,277,032
AUTOMATIC APPARATUS FOR CONTINUOUSLY FORMING CLOTH ROLLS

Pietro Alberto, Via Lamarmora, 16, and Giorgio Meneghetti, Via Schiapparelli, 12, both of Biella, Italy

Filed Nov. 27, 1979, Ser. No. 97,638
Claims priority, application Italy, Nov. 29, 1978, 30325 A/78
Int. Cl.³ B65H 19/26
U.S. Cl. 242—56 R 15 Claims



1. An automatic apparatus for continuously forming cloth rolls from a fabric substantially in the shape of a band made of a multiplicity of pieces mutually joined together by sewing, comprising a cloth feeding station; conveying means for the forward movement of the cloth; presetable control means for said conveying means capable of causing the cloth to advance successively along paths of the same length; a measuring station for detecting the length of cloth advanced from the feeding station; a cloth rolling up station; a tube feeding means, each tube being the core of a roll to be formed, said means being provided to carry successively each tube from a tube magazine to said rolling up station; a cutting station for transversely cutting the cloth; discharge means for the finished rolls, wherein the cloth feeding station comprises first detecting means upstream of the measuring station being responsive to the seams between two adjoining pieces to disable said presetable control means, the measuring station comprising second detecting means enabled by said first detecting means to be also responsive to said seams to cause the cloth feed to

stop once a seam arrives at this station, there being further provided control means for causing the cloth to be fed forward along a fixed length corresponding to the distance between the measuring station and the cutting station.

4,277,033

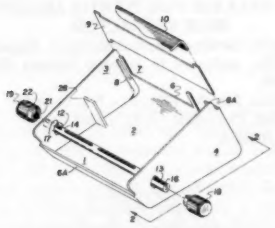
WEB SUPPLY ARRANGEMENT

Robert E. Swenson, P.O. Box 688, Jeffersonville, Ind. 47130

Continuation of Ser. No. 835,730, Sep. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 657,619, Feb. 12, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 953,931

Int. Cl.³ B65H *17/02*

U.S. Cl. 242—67.3 R **3 Claims**



1. A web supply and take-up arrangement including:

(a) a web supply roll means to provide a supply of selected web;

(b) a rotatable web take-up means to receive web supplied from said web supply roll means including elongate web take-up spindle means of selected diameter having at least one longitudinally extending groove means of selected depth located adjacent at least one first end of said spindle means, and wherein said web is would onto a portion of said spindle means adjacent said groove means upon rotation of said spindle means;

(c) flexible radially outwardly biased detent means disposed for rotation with said spindle means and normally located radially outwardly from said groove means and spaced aligned relation therewith whereby said detent means is capable of being selectively urged into said groove means;

(d) journal means including cooperative aperture means to rotatably receive said first end of said spindle means, wherein said aperture means has a diameter larger than the diameter of said spindle and a portion of the periphery of said aperture means engages said detent means to urge said detent means into said groove means, saidaperture means periphery further includes outwardly extending lobe opening means for receiving said detent means to restrict rotation of said spindle means; and (e) web guide means to guide said web from said web supply means to said web take-up means.

4,277,034

PAPER ROLL HOLDER WITH DANCER BAR FOR USE WITH PRINTERS AND THE LIKE

James M. Buzzell, Deerfield, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed May 21, 1979, Ser. No. 40,897

Int. Cl.³ B65H *17/02*

U.S. Cl. 242—67.3 R **12 Claims**

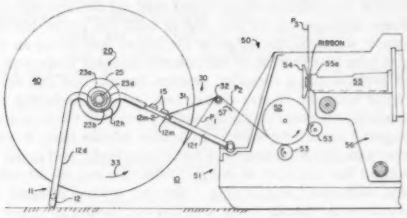
1. A holder assembly for a paper supply roll comprised of an elongated paper web of indeterminate length being wound in the form of a paper supply roll, said holder assembly comprising:

an axle assembly insertable through the central opening of said paper supply roll;

holder support means for rotatably supporting the free ends of said axle assembly;

dancer bar means including a dancer bar and means for resiliently mounting said dancer bar to said holder support means;

the paper from said paper supply roll extending from said supply roll and being guided about said dancer bar so as to move the dancer bar against its resilient mounting means during a paper feed operation; and



said resilient dancer bar support means being adapted to yieldably bend upon the abrupt feeding of the portion of the paper web extending away from said dancer bar, whereby said resilient mounting means act to substantially fully absorb any abrupt pulling of the paper web during feeding of the paper in order to prevent the abrupt pulling of the paper web to be imparted to the paper supply roll to assure that the paper will be fed in a neat, orderly fashion.

4,277,035

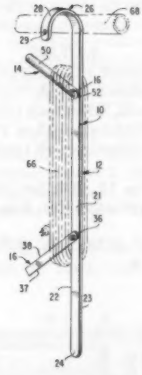
FLEXIBLE MEMBER CADDY

John M. Gaski, 5821 N. Lacey, Chicago, Ill. 60606

Filed Aug. 13, 1979, Ser. No. 66,071

Int. Cl.³ B65H *75/36*

U.S. Cl. 242—85.9 **14 Claims**



14. An apparatus for windably receiving and storably holding for rapid removal of an elongated continuous flexible insulated conductive wire comprising: an elongated columnar support having a flat longitudinal column, said flat column having a pair of longitudinally spaced square apertures formed therein, each of said square apertures having a pair of opposed corners defining a diagonal being aligned with each other and being substantially parallel to the length of the column, a rest end formed integral with one end of the flat column, and a support head formed integral with the other end of the flat column, said support head having a flat arcuate band having one end formed integral with said other end of the flat column and a mounting aperture formed in the free end of the arcuate band, an elongated lower arm being flat and having a pair of opposed edges extending the length of the arm, said lower arm

having a lower arm square aperture adjacent to one end, said lower arm square aperture having a pair of opposed sides substantially parallel to the edges of the lower arm; a lower fastener securing the lower arm to the column, said lower fastener including a bolt extending through the aperture adjacent to the rest end of the column and through the aperture in the lower arm, said bolt having a head and a square shank adjacent to the head, said square shank being mateably positioned in the aperture of the lower arm and one aperture in the column adjacent to the rest end to hold the lower arm in an attitude, whereby one edge of the lower arm forms an acute angle with that portion of the column adjacent to the rest end, said bolt having a threaded portion having one end formed integral with the square shank, said fastener including a nut threadedly mounted on the threaded portion of the bolt; and an elongated upper arm having a circular tubular body having a center axis along the length of the tubular body; said upper arm having a flat end formed integral with one end of the tubular body; said upper arm having a flat end formed integral with one end of the tubular body; said flat end having an upper arm square aperture formed therein with a pair of opposed sides of the apertures being parallel to the axis of the tubular body; and an upper fastener releasably securing the upper arm to the column; said upper fastener including an upper bolt; said upper bolt havng an upper head; an upper square shank formed integral with the upper head and an upper threaded portion formed integral with the upper square shank; the upper square shank of the upper bolt being mateably and removably mounted in the upper arm square aperture and the other square aperture in the column adjacent to the support head to hold the upper arm in an attitude, whereby the center axis of the tubular body forms an acute angle with that portion of the column adjacent to the support; said upper fastener includes a wing nut mounted on the upper threaded portion of the upper bolt for releasably holding the upper square shank in said other square aperture in the column and the square aperture in the upper arm, whereby release of wing nut allows the upper square shank to be removed from one of said apertures to allow the upper arm to pivot toward the lower arm to facilitate removal of a wound wire from the upper and lower arms.

4,277,036

AUTOMATIC WIND-UP ROLLER FOR A SAFETY BELT

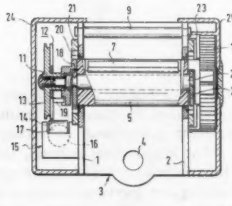
Helmut Seifert, Schwäbisch Gmünd; Wolf-Dieter Hönl, Mutlangen; Johannes Schmid, Schwäbisch Gmünd-Hussenhofen, and Bernhard Frei, Waldstetten, all of Fed. Rep of Germany, assignors to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep of Germany

Filed Jun. 13, 1979, Ser. No. 48,184

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1978, 2826286

Int. Cl.[3] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **1 Claim**



1. Automatic wind-up roller for a safety belt of a vehicle with means to block a belt shaft on which the safety belt is wound in case of danger, having a housing, a belt shaft rotatably supported in the housing, a safety belt rolled around the belt shaft, a release mechanism which is activated when a predetermined acceleration or deceleration of the vehicle is exceeded, a single control element arranged on the axis of said belt shaft at one end of the belt shaft to normally rotate with the belt shaft, activated by the release mechanism, at least two locking pawls with at least one locking pawl at each end of the belt shaft activated simultaneously by said single control element, locking tooth means at each end of the belt shaft for engagement with the locking pawls, said locking pawls when activated simultaneously interacting with said locking tooth means to block said belt shaft, and wherein at least one connecting shaft connects said locking pawls arranged at each end of the belt shaft and which locking pawls are movable radially into the locking position away from the belt shaft axis, said belt shaft having a hollow space for the disposition of said connecting rod.

4,277,037

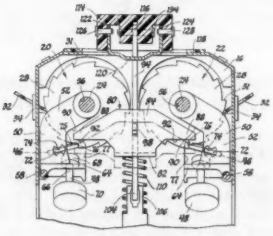
LOCK BAR RELEASE FOR INERTIA LOCKING SEAT BELT RETRACTOR

Richard D. Loose, Birmingham, and Harley L. Kapanka, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 30, 1980, Ser. No. 116,836

Int. Cl.[3] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **3 Claims**



1. A seat belt retractor for winding an occupant restraint belt comprising:

a housing having laterally spaced first and second walls;

a belt reel journaled for rotation on the housing walls;

a ratchet plate attached to each end of the reel generally adjacent the housing walls;

a lock bar extending generally between the housing walls and journaled for rotation relative thereto, said lock bar having locking teeth adapted for selective engagement with the ratchet plates upon rotation of the lock bar toward the ratchet plates;

a release member adapted to forcibly disengage the lock bar from engagement with the ratchet plates, said release member having laterally spaced first and second abutment portions adapted to extend between the respective ratchet plate and the adjacent housing wall to overlie the locking teeth of the lock bar in spaced relation therefrom; and

manually actuated release means adapted to move the release member into simultaneous engagement with the latch teeth at both ends of the lock bar to forcibly disengage the lock bar from engagement with the ratchet plates whereby belt unwinding rotation of the reel is permitted.

4,277,038

TRAJECTORY SHAPING OF ANTI-ARMOR MISSILES VIA TRI-MODE GUIDANCE

Robert E. Yates; John P. Leonard; Robert E. Alongi; Wilfredo V. Albanes, and Charles M. Bishop, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

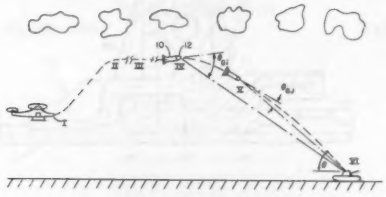
Filed Apr. 27, 1979, Ser. No. 34,088

Int. Cl.[3] **F42B** *15/02*

U.S. Cl. 244—3.15 **6 Claims**

1. A missile guidance system for guiding a missile in a prede-

termined trajectory to impact with a target, said trajectory including initial climb, cruise, and attitude transition portions, said guidance system comprising: a seeker carried by said missile for tracking said target; an autopilot, said seeker having a yaw rate channel output coupled to said autopilot for controlling flight of the missile by proportional navigation in the yaw plane; a pitch programmer coupled to said autopilot for controlling flight of the missile in the pitch plane during said climb and cruise portions; a pseudo-time-optimal controller



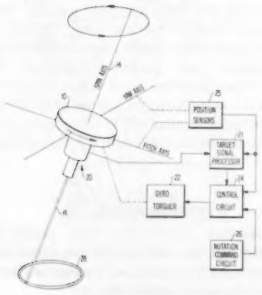
coupled to said autopilot for sharply diving said missile towards the target; and means for controlling the missile in pitch during said attitude transition portion including, threshold detector and switching logic means coupld for receiving pitch gimbal angle signals from said seeker for causing said pseudo-time-optimal controller to apply a constant angular rate to the missile to cause the missile to pitch down sharply towards the target under control of said pseudo-time-optimal controller.

4,277,039

METHOD AND SYSTEM FOR INDUCING AND CONTROLLING NUTATION OF A GYROSCOPE

Robert B. Blanning, Orlando; Archie B. Treadwell, Winter Park, and James A. Logie, Orlando, all of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Feb. 22, 1978, Ser. No. 880,210
Int. Cl.³ F41G 7/26; G01C 19/54
U.S. Cl. 244—3.16 **32 Claims**



1. A system for scanning an area of interest in relation to a space stabilized reference axis comprising:

a momentum member rotatably mounted on a support so as to rotate about a spin axis and establish a space stabilized reference;

a sensor having a line-of-sight and being mounted with the line-of-sight in known relation to the space stabilized reference;

electrical signal responsive means cooperating with the momentum member for selectively applying torque to the member; and

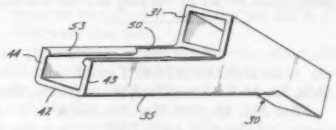
means for selectively generating a torquer control signal and applying said control signal to said signal responsive means, said control signal having characteristics causing a controlled nutation of the momentum member such that the spin axis and the sensor line-of-sight move through a desired scan pattern centered about the space stabilized reference.

4,277,040

KITE STRUT CONNECTOR

Julius M. Christoffel, Jr., Decatur, Ill., assignor to Damon Corporation, Needham Heights, Mass.

Filed Jul. 14, 1978, Ser. No. 920,679
Int. Cl.³ B64C 31/06; A63H 27/08
U.S. Cl. 244—153 R **2 Claims**



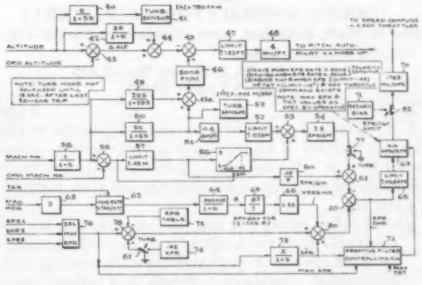
1. In a collapsible kite structure having a front end, at least two stiffening support struts secured to a body of flat material and at least one bracing strut detachably secured to the stiffening struts, the improvement comprising a snap lock including a fastening body affixed to one stiffening strut and a resilient hollow retainer body extending laterally from said fastening body with the hollow opening therein fixedly aligned to receive an end part of the detachable strut, wherein said retainer body includes a slot through the side thereof and facing the front end of said kite and extending longitudinal to the extension of the retainer body for the passage therethrough of an end part of the detachable strut, and wherein the interior of said retainer body is configured to removably and replaceably receive and to snugly and resiliently hold said end part of the detachable strut, and further including resilient interengaging means adjacent the hollow portion of said retainer body and adjacent said slot for resiliently engaging the end portion of the detachable strut within said hollow retainer body, said interengaging means comprising a longitudinal bead along at least a part of the inner edge of at least one side of said slot.

4,277,041

AIRCRAFT CRUISE SPEED CONTROL SYSTEM

Graham J. Marrs, Lancaster; Richard J. Oliver, Newhall; Alfred J. Potthast, Northridge, and Roland M. Samuelson, Saugus, all of Calif., assignors to Lockheed Corporation, Burbank, Calif.

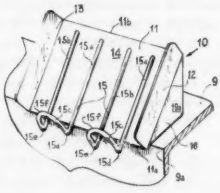
Filed Sep. 11, 1978, Ser. No. 941,230
Int. Cl.³ G05D 1/08
U.S. Cl. 244—182 **32 Claims**



1. An aircraft speed control system for controlling an engine through a throttle linkage and for controlling aircraft pitch comprising:

means for determining the speed error which is the difference between actual and commanded speed,
means for determining the altitude error which is the difference between actual and commanded altitude,
means for generating an altitude rate term from said actual altitude,
means for generating a speed rate term from said actual speed,
speed means for using the sum of the speed error and speed rate terms to control aircraft speed through said engine and throttle linkage, and
pitch means for using the sum of altitude error, altitude rate term and speed rate term to control aircraft pitch to correct small speed errors by varying aircraft altitude.

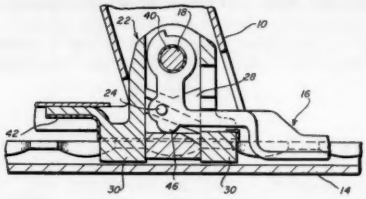
4,277,042
BAR SOAP RECEPTACLE
Arthur A. Ash, Sr., 34 La Rose Cir. SW., Marietta, Ga. 30060
Filed Apr. 15, 1980, Ser. No. 140,474
Int. Cl.³ A47F 5/00
U.S. Cl. 248—309 R **11 Claims**



1. A receptacle for a bar of soap which comprises:
(a) a chute having at least one inclined wall which is also a bottom wall thereof and two side walls which extend generally upwardly from the inclined bottom wall, the chute having an opening between the ends of the side walls, the opening extending approximately the entire length of the lower front edge of the inclined bottom wall, the lower front edge of the inclined bottom wall being adapted to extend over the edge of a ledge and downwardly into a sink basin; and
(b) a soap retaining means having at least two ribs connected to the chute, the upper portions of the ribs extending upwardly from the inclined bottom wall to hold the bar of soap out of contact therewith, the lowermost portions of the ribs extending over the lower front edge to facilitate drainage of water and suds away from the bar of soap and to concentrate residual soap solution below the chute so that it will drip into the basin before evaporating to form a soap scum.

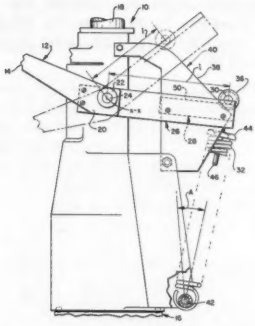
4,277,043
LOCKING ASSEMBLY FOR AIRCRAFT SEAT
Kirby B. Weik, Litchfield, Conn., assignor to Koehler-Dayton, Inc., New Britain, Conn.
Filed May 25, 1979, Ser. No. 42,325
Int. Cl.³ A47B 97/00
U.S. Cl. 248—503.1 **2 Claims**

1. An aircraft seat adapted to be releasably secured to a track having a plurality of longitudinally spaced openings interconnected by slots in the top surface thereof and an internal channel communicating with these openings and slots, comprising:
a rear leg,
a track fitting secured to said rear leg including lug means selectively sized and located for downward insertion into the track channel through selected track openings and for longitudinal displacement therein to a selected position beneath said track slots,
a shear pin selectively configured for substantial mating insertion into one of the spaced track openings,
said shear pin including a flange for engaging the top surface of said track when said shear pin is inserted into one of said openings,
an L-shaped control lever pivotally mounted to said fitting on one end and having a medial elbow portion for camming said shear pin downwardly when said track fitting is at said selected position until said shear pin flange engages the top surface of said track and for then displacing said



lug means upwardly until said track member is forcefully clamped between said lug means and said flange,
said elbow portion including lobe means for maintaining said control lever in its forceful clamping position, and
pin means projecting from said lever proximate said elbow portion for upwardly displacing said shear pin when said lever is releasably pivoted from its clamping position.

4,277,044
MECHANICAL COUNTERBALANCE
W. Duane Hamilton, Middletown, R.I., assignor to American Optical Corporation, Southbridge, Mass.
Filed Sep. 7, 1979, Ser. No. 73,471
Int. Cl.³ F16M 13/00
U.S. Cl. 248—571 **8 Claims**



1. A mechanism for counterbalancing a distally loaded object carrying arm which is proximally pivoted upon a support therefor, said mechanism comprising:
an extension of said arm having thereon a first cam disposed oppositely of said distal loading of said arm;
a first cam follower engaging said first cam;
a second cam fixed to said support for said arm;
a second cam follower engaging said second cam;
means carrying said first and second cam followers;
spring means having one end fixed to said support and an opposite end connected to said carrying means;
said first cam and first follower being constructed and arranged to effect extension of said spring means when said distal end of said arm is lowered and vice versa; and
said second cam and second follower being constructed and arranged to simultaneously move said opposite end of said spring means toward the location of proximal pivoting of said arm when said distal end of said arm is lowered and vice versa;

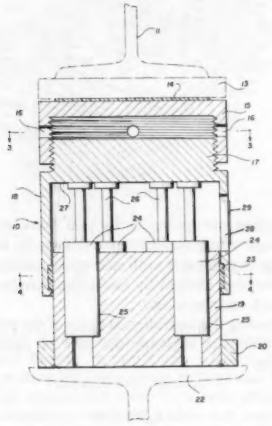
whereby arm length-to-moment ratio and spring force angle are altered to compensate spring extension forces.

4,277,045

LIQUID SPRING STANCHION

Thomas C. Bargeron, 3832 Williamsburg Cir., Birmingham, Ala. 35243, and Stanley T. Moodie, 3300 Burningtree Dr., Birmingham, Ala. 35226

Filed Oct. 23, 1978, Ser. No. 953,915
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—599 **4 Claims**



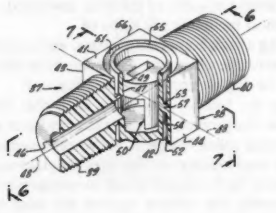
4. A stanchion comprising a substantially solid base member adapted to be fixed to an underlying support, a hollow cover member telescopically engaged over the solid base member and extending thereabove to define a chamber above the base member, load bearing spring means within said chamber, a threaded extension rising from the cover member, a coacting adjusting cap having screw-threads on said extension and including a top dry lube bearing surface for sliding contact with an overhead structure being supported, said cap having diametrically arranged turning tool engaging elements whereby the height of the cap is easily adjusted, and a dry lube bearing strip to resist lateral forces disposed between the telescopically engaging parts of the base member and cover member and being held in a recess formed in the cover member.

4,277,046

IRRIGATION VALVE

Watson V. Cavileer, 2861 Amherst Dr., Fullerton, Calif. 92631

Continuation-in-part of Ser. No. 945,337, Sep. 25, 1978, abandoned. This application Jun. 13, 1980, Ser. No. 159,124
Int. Cl.³ F16K *5/02*
U.S. Cl. 251—312 **11 Claims**



1. A valve comprising

a body of resilient plastic material having opposite top and bottom walls,

a relatively deep narrow uninterrupted annular groove extending inwardly from each of said walls,

said grooves extending toward each other and having inner ends closely spaced apart at a location intermediate said top and bottom walls, so that said body has an outer portion on the outside of said grooves, an inner portion on the inside of said grooves, and a connecting portion between said ends of said grooves connecting said inner portion and said outer portion,

said inner portion having an opening therein having a frustoconical surface closely spaced from said grooves so that said inner portion has a continuous relatively thin wall,

and a passageway extending through said outer portion, said connecting portion and said inner portion and intersecting said opening in said inner portion,

and a valve member in said opening,

said valve member having a frustoconical exterior surface complementarily engaging said frustoconical wall of said opening in said inner portion,

said valve member having a passageway therethrough and being rotatable relative to said body for selectively interconnecting said passageway in said valve member with said passageway in said body for controlling the flow of fluid through said body,

said inner portion having a shoulder overlapping the outer end surface of said valve member for retaining said valve member in said opening,

said valve member having a greater external diameter adjacent the outer end surface thereof than the free diameter of said opening adjacent said shoulder,

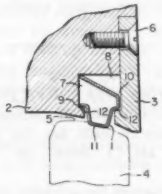
whereby said valve member has an interference fit within said opening for providing a seal between said valve member and said body.

4,277,047

METALLIC SEALING DEVICE FOR VALVE

Sadazi Zinnai, Yokohama, Japan, assignor to Tokyo Koso Kabushiki Kaisha, Saitama, Japan

Filed Jan. 28, 1980, Ser. No. 116,248
Claims priority, application Japan, Jan. 30, 1979, 54-8780
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—362 **1 Claim**



1. A metallic sealing device for a valve including a fluid passage therein and an inner valve positioned in said fluid passage, which comprises an annular groove having nearly T-shape in section formed around the fluid passage by the valve body and a metallic seat retainer fixed thereto and a metallic seat arranged in said annular groove and partially projecting into the fluid passage, said metallic seat comprising a metallic sheet having a projecting part for contacting with the inner valve, shoulders formed at the sides thereof to limit the projection of said seat into the fluid passage and an extension of one of said sides extending in the nearly T-shaped groove at the part opposite to the fluid passage toward the other of said sides, thereby promoting the fluid sealing property as well as elastic property of the metallic seat and nullifying the dependency of the sealing property thereof on the fluid flowing direction to utilize the function of the fluid pressure at

the time of shutting off the fluid, said metallic seat being formed by press-forming of a single sheet metal.

4,277,048

HYDRAULIC ACTUATOR WITH AUTOMATIC TRAVEL LIMIT BYPASS

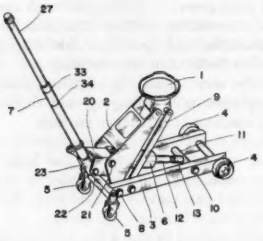
Genzaburo Okuda, 263-banchi Tanjo Mihara-cho, Minamikawachi-gun Osaka-pref, Japan

Filed Aug. 24, 1979, Ser. No. 69,508

Claims priority, application Japan, Aug. 28, 1978, 53/117511[U]

Int. Cl.³ B66F *3/24*

U.S. Cl. 254—8 B **8 Claims**



1. In a hydraulically operated lifting device of the type wherein load-supporting means is mounted for vertical movement on frame means, and cylinder-and-piston means is connected between the frame means and load-supporting means for effecting said vertical movement in response to hydraulic fluid intermittently supplied under pressure from reservoir means by pump means manually actuated by handle means mounted for swinging movement on said device, the improvement which comprises end wall means for the cylinder provided with a bore which slidably receives and wholly supported the piston for axial movement, said bore being provided with a bypass opening located medially of the ends of the bore and in communication with the fluid reservoir means, the piston being provided adjacent its inner end with a bypass for communication between the interior of the cylinder and the bypass opening at a predetermined position of the piston to limit further outward movement of the piston, and annular sealing means in said bore located axially on each side of the bypass opening.

4,277,049

LIFT STRUCTURE FOR SERVICING VEHICLES

Donald A. Clausen, 815 W. 34th St., Minneapolis, Minn. 55408

Filed May 19, 1980, Ser. No. 151,257

Int. Cl.³ B66F *7/02*

U.S. Cl. 254—91 **2 Claims**

1. An elevating structure for servicing relatively small vehicles, having in combination

a base frame substantially rectangular in plan,

a pair of transversely spaced upstanding frame members adjacent one end of said base frame,

a cross member removably carried by said upstanding frame members,

said cross member carrying a winch,

longitudinally spaced transversely disposed pairs of elevating members pivoted to said base frame at their lower ends,

a pair of longitudinal transversely spaced supporting frame members pivotally carried by said last mentioned elevating members,

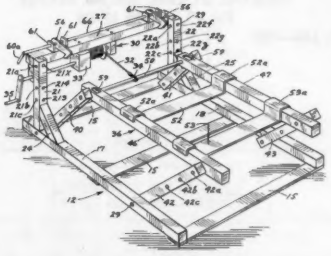
a shaft extending transversely of said last mentioned longitudinal members at their end portions adjacent said cross member,

said winch having a cable removably connected to said shaft,

a pair of longitudinally spaced plate members carried by said pair of longitudinal members,

said cross member carrying a pair of hook members,

said longitudinal members carrying a pair of recessed keepers at their respective ends adjacent said cross member to



be engaged automatically by said hook members when said longitudinal members are drawn by said cable into abutting engagement with said cross member,

a crank member carried by said cross member disengaging said hook members, and

bolts extending through aligned holes of the pair of elevating frame members adjacent the pair of upstanding frame members.

4,277,050

METHOD OF JACKING UP A VEHICLE, AND JACK THEREFOR

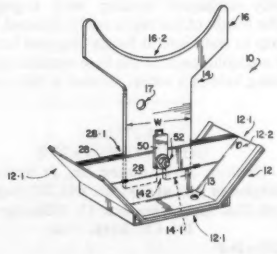
Jacob J. Mostert, West Krugersdorp, Muldersdrif, South Africa (1742)

Filed Aug. 13, 1979, Ser. No. 66,082

Claims priority, application South Africa, Aug. 25, 1978, 78/4857; Nov. 3, 1978, 78/6218

Int. Cl.³ B66F *7/24*

U.S. Cl. 254—94 **17 Claims**



1. A method of jacking up of a road vehicle having a pair of double wheels, of the kind described;

the method including the steps of

providing a jack comprising a base, and a strut adapted to pass into the clearance space between the wheels, the strut having an upper load bearing end;

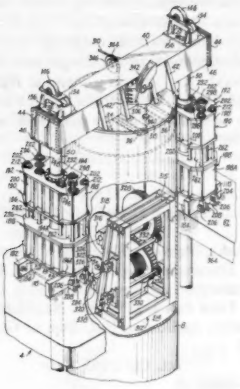
locating the jack in a position such that the base rests against the ground, such that the strut is at a slope in the clearance space between the wheels, and such that the upper load bearing end engages simultaneously with the bosses of both wheels along an engagement zone; and

then moving the vehicle against the strut to cause the wheels to ride up onto the strut in polevault fashion, to lift the wheels clear of the ground.

4,277,051
TILT-UP/JACK-UP OFF-SHORE DRILLING APPARATUS AND METHOD

Joseph E. Lucas, Houston, Tex., assignor to Marine Engineering Company, C. A., Caracas, Venezuela

Filed Apr. 24, 1978, Ser. No. 899,391
Int. Cl.[3] B66F *1/00*
U.S. Cl. 254—106 23 Claims

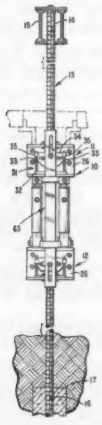


11. The method of substantially evenly distributing the load in a jacking unit having an upper and a lower slip housing surrounding a jacking leg and a piston and cylinder for moving the slip housings toward and away from each other along the jacking leg, comprising: axially-yieldably and angularly-flexibly attaching one end of the piston to one of the slip housings; and axially-yieldably and angularly-flexibly attaching the end of the cylinder remote from the piston to the other slip housing, whereby to avoid misalignment between the piston and cylinder under load conditions.

4,277,052
JACKING APPARATUS

Franz Kallinger, 58 Hunt Ter., Greenwich, Conn. 06830

Filed Aug. 17, 1979, Ser. No. 67,533
Int. Cl.[3] B66F *1/00*
U.S. Cl. 254—106 18 Claims



1. In an apparatus for selectively moving a load, said apparatus being arranged for use with an elongated structural element having a plurality of longitudinally spaced substantially similar projecting shoulder portions, said apparatus having gripping means comprising:

wall means defining a portion of the gripping means engageable with said structural element and having a grooved surface configuration complementary to said shoulder portions of the structural element;

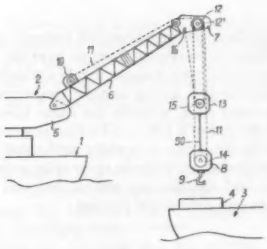
means for mounting said wall means adjacent said structural element including a parallelogram linkage carrying said wall means for causing the wall means to be maintained parallel to the longitudinal extent of the elongated structural element in engaging said element; and

means for resiliently urging the wall means into engagement with said element to have mechanically interlocked engagement selectively with successive ones of said shoulder portions as said apparatus is caused to be aligned successively with said successive ones of the shoulder portions, said resilient urging means permitting said surface configuration of the wall means to adjustably seat on said shoulder portions for subsequent transfer of force from the load for firmly locking the gripping means to the element to support the load.

4,277,053
LIFTING AND HANDLING EQUIPMENT UNIT, ESPECIALLY FOR SHIPSIDE OPERATIONS

Francois Simon, Route d'Annecy, 73410 Albens, France

Filed Sep. 29, 1978, Ser. No. 947,013
Claims priority, application France, Dec. 20, 1977, 77 29835
Int. Cl.[3] B66D *1/48*
U.S. Cl. 254—326 5 Claims



1. A lifting and handling equipment unit comprising a powered hoisting machine for controlling lifting and handling operations between a hoisting machine support and a load support, said hoisting machine including a boom having a boom head, said load support being naturally movable with respect to said boom head in a vertical direction, said lifting equipment comprising:

a first hoisting sheave block provided with at least one first idle pulley and with a load-carrying means for carrying a load,

a second floating compensation sheave block provided with at least one second idle pulley and adapted for upward and downward movements relative to said first sheave block,

at least one third idle pulley vertically fixed with respect to the boom head, said first, second and third pulleys being vertically aligned,

a cable reeved around said first, second and third pulleys and anchored at at least one of its ends, so that said first and second sheave blocks are freely suspended to said third pulley by said cable, said second floating compensation sheave block forming a counterweight upwardly biasing said first hoisting sheave block when substantially no downwardly directed external force is applied to said load-carrying means,

stop means for limiting at least the upward movement of said second floating compensation sheave block relative to said first hoisting sheave-block when a downwardly directed

external force is applied to said load-carrying means, whereby said second floating compensation sheave block is in its upper stopped position when the load is carried by the load carrying means, said second floating compensation sheave block virtually movable by gravity force with respect to said hoisting machine support, to said first hoisting sheave block and to said load support when said load carrying means and said first hoisting sheave block are maintained fixed with respect to said load support, said free vertical movement of said second floating sheave block being responsive to the vertical relative movement between said machine and load support.

4,277,054

MULTIFLOW REFINING BLASTPIPES FOR EQUIPPING CONVERTERS FOR REFINING

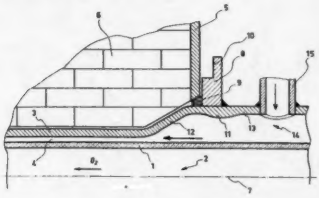
Hugues Zanetta, Metz, France, assignor to Creusot-Loire, Paris and Emile Sprunck, Moyeuvre Grande, both of, France

Filed Nov. 5, 1979, Ser. No. 91,138

Claims priority, application France, Nov. 29, 1978, 78 33911

Int. Cl.³ C21B *7/16*

U.S. Cl. 266—268 **2 Claims**



1. A multiflow refining blastpipe through which fluids are introduced into a converter from an inlet for said fluids, and comprising at least two concentric tubes which define between them an annular gap, and an annular ring connected by welding to the outer tube, wherein the outer tube exhibits in the vicinity of the end of it which is located next to the inlet for the fluids into the blast-pipe a shoulder prolonged by a cylindrical portion which defines with the inner tube an annular chamber wider than said annular gap and in that said annular ring is arranged on said cylindrical portion.

4,277,055

CUSHIONING FENDER

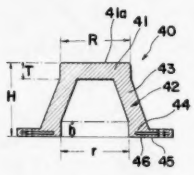
Tetsuo Yamaguchi, and Tomokazu Kashiwara, both of Nishinomiya, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Dec. 26, 1978, Ser. No. 972,829

Claims priority, application Japan, Sep. 21, 1978, 53/130741[U]; Sep. 21, 1978, 53/130742[U]

Int. Cl.³ F16F *1/36*; B63B *59/02*

U.S. Cl. 267—140 **9 Claims**



1. A cushioning fender adapted to be mounted on one or both of an impact applying element and an impact receiving element for cushioning the impact applied from the impact applying element to the impact receiving element, said fender comprising a substantially cup-like body of one-piece construction made of an elastic material and including a circular buffer block having an outer surface adapted to serve as an impact receiving surface to which the impact is applied, said buffer block having a thickness within the range of about 0.15H to about 0.25H, wherein H represents the overall height of the fender and a hollow support wall depending from the circular buffer block and radially outwardly enlarged in a direction away from the buffer block, said hollow support wall being constituted by a leg section of uniform wall thickness and a heel section on one side of the leg section remote from the buffer block, one annular end of said heel section opposite to the leg section being formed integrally with a radially outwardly extending annular fitting flange, said buffer block having its peripheral face lying in a plane at right angles to the plane of the impact receiving surface and a diameter substantially equal to or smaller than the maximum inner diameter of the heel section.

4,277,056

HYDRAULICALLY DAMPED RUBBER MOTOR MOUNTING

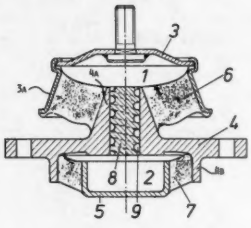
Gerd-Heinz Ticks, Birkenau, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Jul. 6, 1979, Ser. No. 55,463

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1979, 2905091

Int. Cl.³ F16F *9/34*

U.S. Cl. 267—140.1 **6 Claims**



1. A hydraulically damped rubber motor mount comprising a mounting flange, a motor connection above the flange, a rubber annulus interconnecting the connection and flange and forming therewith a hydraulic chamber, an elastically expansible and contractible hydraulic enclosure, means for hydraulically interconnecting the chamber and enclosure via a flow path that is of substantially uniform cross-sectional area throughout its length and at least 50 times longer than its cross sectional area, and hydraulic fluid filling the chamber, enclosure and path.

4,277,057

METHOD FOR USING A MULTIPLE INPUT BIN COLLATING MACHINE WITH A SINGLE OUTPUT HOPPER

Wilfried Jaedicke, Abenberg, Fed. Rep. of Germany, assignor to Maul Lochkartengeräte GmbH, Schwabach, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 98,137

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851754

Int. Cl.³ B65H *39/04*

U.S. Cl. 270—58 **3 Claims**

1. A method for utilizing a collating machine having a plurality of infeed bins equal to B and exactly one output hopper for conveniently sorting a plurality of stacks of sheets exactly equal to B into a plurality of sets of sheets exactly equal to S

wherein each of the sets of sheets contains a plurality of

pages exactly equal to P arranged in a first predetermined order

and wherein B, S and P are each integers at least equal to 2 and all sets are to be sorted into the output hopper in a single stack in which stack each of the sets retains the first predetermined order and the sets themselves are arranged in a second predetermined order

when the machine is programmed to feed sheets from the bins into the hopper to form a collated stack with a top and a bottom in a repeated sequence, which sequence has a plurality of operations equal to B and which sequence is repeated a plurality of times equal to P and in which

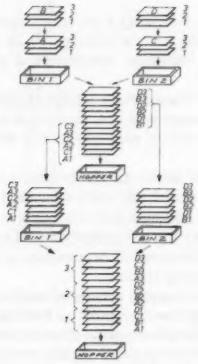
a single sheet is selected from a first bin and is fed into the hopper and

another single sheet is selected from another bin and is fed into the hopper

with such selection and feeding encompassing all the bins in a third predetermined order until exactly B sheets have been fed into the hopper, at which point

the sequence is repeated a plurality of times exactly equal to P, beginning again with the first bin and maintaining the third predetermined order until all sheets in all bins have been fed into the hopper, the method comprising the following steps:

(a) providing a plurality of groups exactly equal to P of sheets, each group containing a plurality of identical pages exactly equal to S;



(b) providing a plurality of X-cards, which X-cards are easily visually distinguishable from the sheets, the plurality of the X-cards being exactly equal to P;

(c) stacking each group into an individual stack with a top and a bottom;

(d) placing each X-card on one of said top and bottom of each group so individually stacked so as to bring the X-cards and individual stacks into one-to-one correspondence;

(e) arranging all the individually stacked groups with their X-cards in the first predetermined order;

(f) computing a first quotient in which P is numerator and B is denominator;

(g) determining whether said quotient is an integer;

(h) in the event that said first quotient is non-integral, computing a number N, which, when added to P and used as numerator in a second quotient in which B is denominator, is of such a value as to produce a second quotient which is an integer;

(i) in the event that said first quotient is non-integral, providing a plurality of blank sheets, which plurality is exactly equal to N multiplied by S;

(j) in the event that said first quotient is non-integral, stacking said plurality of blank sheets into exactly N additional groups, each group having a top and a bottom and each such group containing exactly S sheets;

(k) in the event that said first quotient is non-integral, providing an additional plurality of X-cards, which additional plurality of X-cards is exactly equal to N;

(l) in the event that said first quotient is non-integral, placing each additional X-card on said one of said top and bottom of each additional group so as to bring the additional X-cards and additional groups into one-to-one correspondence;

(m) arranging any and all additional groups with their X-cards after the first predetermined order to form a series of groups;

(n) dividing the series of groups evenly into B super-groups, with each super-group containing an equal number of sheets and X-cards, while maintaining the order of the groups within the super-groups;

(o) placing each super-group into a corresponding one of the bins in the third predetermined order;

(p) operating the machine to feed all the sheets and X-cards into the hopper;

(q) determining the number of X-cards which are located on said one of the top and bottom of the collated stack;

(r) in the event that the number of X-cards which are located on said one of the top and bottom of the collated stack is equal to the sum of P and N if N was computed and P otherwise, removing the sets from the hopper; and

(s) in the event that the number of X-cards which are located on said one of the top and bottom of the collated stack is unequal to the sume of P and N if N was computed and P otherwise, re-dividing the collated stack into B super-groups each containing an equal number of sheets and X-cards while maintaining any order of the sheets and re-placing the super-groups into the bins while maintaining all previous orders, and re-operating the machine to feed all the sheets and X-cards into the hopper once again; and

(t) repeating the steps listed in steps (r) and (s) above as many times as are necessary until the number of X-cards which are located on said one of said top and bottom of said collated stack is equal to the sum of P and N if N was computed and P was not computed.

4,277,058

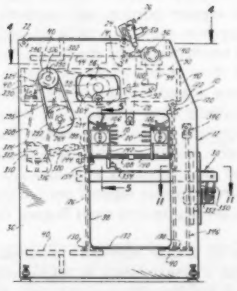
FOLDING APPARATUS AND METHOD FOR FOLDING A CONTINUOUS WEB

Frank M. Biggar, III, Lakeview, N.Y., assignor to Elizabeth Short Biggar, Hamburg, N.Y.

Filed Feb. 16, 1979, Ser. No. 12,799

Int. Cl.³ B65H *45/20*

U.S. Cl. 493—433 **13 Claims**



1. In a method of folding a continuous web of material such as paper wherein the web is guided generally downwardly by an oscillating arm that oscillates fore and aft about a horizontal transverse axis relative to the direction of web travel and directed by the oscillating arm alternatively between opposed folding assemblies, said folding assemblies having a plurality of gripper means which travel continuously about a preselected

path and which receive the web at locations where the fold is to occur, grip and thus fold the web, and thereafter release the web allowing it to exit downwardly in a folded configuration, said method comprising the steps of:

timing the gripper means at web speeds in excess of 800 fpm (243.84 meters per minute) to receive the web fed thereto and then close on and fold the web before the oscillating arm swings so far toward the opposite folding assembly as to allow the web to escape from the gripper means,

after gripping the web to create a fold, continuing to grip the folded web while other gripper means of the same folding assembly and the opposite folding assembly grip the web at other locations to create other folds as the folded web moves downwardly, whereby at least three folds are gripped by each folding assembly at any instant of time as the folded web continues its downward movement.

4,277,059

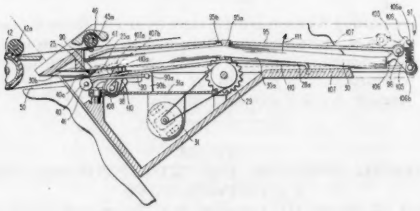
SHEET FEEDER FOR TYPEWRITERS

Gordon R. Dunning, Versailles, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1980, Ser. No. 131,324

Int. Cl.³ B65H *3/20*

U.S. Cl. 271—23 **12 Claims**



1. In a sheet paper feed apparatus for a printer having a platen for holding and providing at least longitudinal motion to a sheet of paper, said apparatus comprising a rectangular tray including a rear paper support portion and a spaced apart forward paper support portion, said portions for supporting thereon the opposite ends of a stack of paper, at least one shingler wheel intermediate said support portions for engaging the lowermost sheet of said paper sheet stack, and means for effecting rotation of said shingler wheel in a first direction to move the lowermost sheet of said stack away from said forward support portion until said lowermost sheet is no longer supported thereby, and then in the opposite direction to drive said lowermost sheet beneath said forward paper support portion, said forward paper support portion comprising a pair of inwardly projecting, spaced apart fingers, the improvement comprising:

paper stack lift means moveably mounted adjacent said fingers, and actuator means to effect movement of said paper stack lift means between a first recessed position below said fingers and a second position above said fingers so that upon loading of said stack of papers into said tray, said lift means is first placed in said second position by said actuator means, said paper stack impinging upon said rear paper support portion and said lift means, and then said lift means is moved to said first position by said actuator means to deposit said stack of paper on said fingers.

4,277,060

METHOD OF FORMING A PACKET OF SIGNATURES AND STACKER FOR IMPLEMENTING SAID METHOD

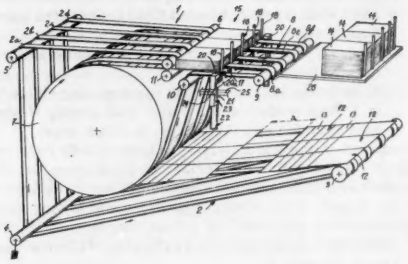
Aldo Perobelli, and Giorgio Pessina, both of Paderno Dugnano, Italy, assignors to Messrs. O.M.G. Officina macchine Grafiche de pessina e Perobelli, Paderno Dugnano, Italy

Filed Sep. 14, 1979, Ser. No. 75,586

Claims priority, application Italy, Nov. 21, 1978, 29983 A/78

Int. Cl.³ B65H *29/00*

U.S. Cl. 271—186 **10 Claims**



1. A method of forming a packet of signatures including the step of depositing onto a feeding belt of a stacker signatures from a folding machine, characterized in that said method comprises:

(a) the step of transporting groups of said signatures in overlapping arrangement to a stacking station including detent means selectively movable to and from a stacking position;

(b) the step of detecting the presence or absence of signatures upstream of said stacking station by upstream sensor means, and issuing a corresponding control signal to said detent means for movement thereof to said stacking position upon detection of the presence of signatures upstream of said stacking station;

(c) the step of forming a stack of said signatures by feeding of said signatures carried by said belt against detent means, while said detent means is in said stacking position;

(d) the step of moving said detent means from said stacking position after a stack is formed to permit a formed stack to be carried downstream from said stacking station;

(e) the step of carrying a formed stack of said signatures downstream from said stacking station, and

(f) the step of detecting the presence or absence of signatures downstream from said stacking station by downstream sensor means, and issuing a corresponding control signal for controlling movement of said detent means into said stacking position.

4,277,061

APPARATUS FOR CLASSIFYING PHOTOGRAPHIC PRINTS OR THE LIKE

Erich Nagel, Anzing; Rainer Türcke, and Heinz Lüdemann, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,118

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757848

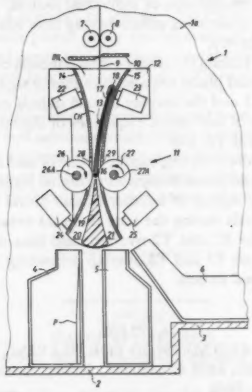
Int. Cl.³ B65H *29/60*

U.S. Cl. 271—302 **25 Claims**

1. Apparatus for classifying successively delivered sheets of predetermined length, particularly for classifying sections which are severed from the leader of a web of exposed and developed photosensitive material having indicia denoting different classes of sections, comprising a support; a carrier pivotally mounted on said support; guide means mounted on

said carrier for pivoting therewith and defining an elongated channel having an inlet and a plurality of outlets remote from said inlet; sheet diverting means including at least one switching member consisting at least in part of magnetizable material, mounted on said carrier for pivoting therewith, and installed in said channel intermediate said inlet and said outlets, said member being movable between a plurality of different positions in each of which it establishes a path for movement of oncoming sheets from said inlet to a different outlet; first magnet means mounted on said carrier for pivoting therewith, located externally of said channel and being operable to move said member to any one of said positions; and second magnet means mounted on said support and operable to pivot said carrier with respect to said support.

14. Apparatus for classifying successively delivered sheets of predetermined length, particularly for classifying sections which are severed from the leader of a web of exposed and developed photosensitive material having indicia denoting different classes of sections, comprising guide means defining



an elongated channel having an inlet and a plurality of outlets remote from said inlet and including two elongated side walls flanking said channel; sheet diverting means including at least two switching members each consisting at least in part of a permanently magnetically attractable material and installed in said channel intermediate said inlet and said outlets, said switching members normally assuming respective rest positions in which they are spaced from each other and from the neighboring side walls and being movable from said rest positions to different active positions in each of which they establish a path for movement of oncoming sheets from said inlet to a different outlet; and magnet means located externally of said channel and including two electromagnets each outwardly adjacent to one of said side walls and being selectively energizable to magnetically attract said switching members from said rest positions to said active positions in which each of said two switching members is situated at the respective neighboring side wall or both switching members are situated at one or the other side wall.

4,277,062
LEG STRETCHING EXERCISE

Mark Lawrence, 212 Church St., White Plains, N.Y. 10603

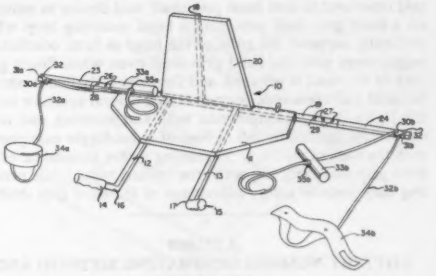
Filed Jan. 28, 1980, Ser. No. 116,007
Int. Cl.³ A63B *23/04, 21/12*
U.S. Cl. 272—126 **6 Claims**

1. A leg stretching exercise device comprising:

a platform having an upright rear portion forming a backrest,

a pair of spaced support members extending outwardly from beneath the platform substantially perpendicular to the backrest, each of said members having an end portion extending upward in a divergent direction and at an acute angle,

a support member extending substantially along the plane of the backrest beneath the platform and outwardly therefrom, the end portions thereof having a tubular configuration with a plurality of spaced apertures along the upper surface thereof,



a pair of telescoping bars each having a plurality of spaced apertures on the upper surface thereof, said bars being mounted one in each end of the tubular support member,

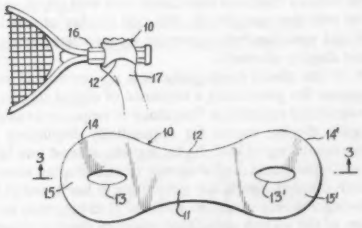
locking means engaging corresponding apertures in the support member and telescoping bars to lock said members together at predetermined lengths, and,

a pulley mounted to an end portion of each bar including a rope engaging the pulley, a stirrup for one's foot at one end of the rope and a handle at the other end of the rope.

4,277,063
SUPPORT DEVICE FOR STRENGTHENING THE HAND GRIPPING OF RACQUET HANDLES AND OTHER SHAFT MEMBERS

Albert L. Perrone, deceased, late of Westwood, N.J., and Mary Perrone, administratrix, 43 Brickell Ave., Westwood, N.J. 07675, assignors to Mary Perrone, Westwood, N.J., administratrix, Estate of Albert Perrone

Filed Mar. 28, 1979, Ser. No. 24,586
Int. Cl.³ A63B *69/38*
U.S. Cl. 273—75 **19 Claims**



1. A support device for strengthening the hand gripping of a racquet handle or other hand grip shaft when held in the palm and encircled by the fingers of the hand, said device being substantially planar and formed of flat sheet material which has planar flexibility and at least in part is resiliently expansible, the central portion of said device being adapted to overlie the back of the hand, one end of the device adapted to extend beyond the thumb side of the hand and having an enlarged enclosed planar rounded contour portion which is substantially wider than said central portion said rounded contour portion being resiliently expansible and having a central aperture spaced

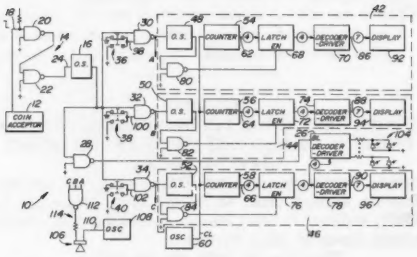
from the outer periphery thereof with said aperture being within the plane of said sheet material, said central aperture being of a size to closely and expansibly engage said hand grip shaft while establishing essentially linear circumferential contact therewith, said enlarged rounded contour extending into said central portion to engage the back of the hand from the base of the thumb to the base of the index finger, the other end of said device adapted to extend beyond the other side of the hand and having means adjustably engaging and securing said other end to said hand grip shaft, said device as mounted on a hand grip shaft providing a hand receiving loop which resiliently supports the palm of the hand in firm, comfortable engagement with the hand grip shaft even when finger gripping of the shaft is released, and the essentially linear circumferential and expansible contact of said central aperture with a hand grip shaft in conjunction with said securing said other end to said base-of-thumb to base-of-index-finger engagement with the back of the hand maintaining rotary orientation of the hand grip shaft with respect to the relaxed hand, while permitting easy forceful rotary adjustment of the hand grip shaft.

4,277,064

LOTTERY NUMBER GENERATING METHOD AND APPARATUS

Thomas M. Newman, Sicklerville, N.J., assignor to Compu-Pic Incorporated, Philadelphia, Pa.

Filed Nov. 6, 1978, Ser. No. 958,083
Int. Cl.³ A63F 9/00
U.S. Cl. 273—138 A **14 Claims**



1. Apparatus, comprising:
at least one clock oscillator for generating a clock signal having a preselected repetition frequency,
plural display channels associated with said clock oscillator,
plural switches associated with said display channels, each of said switches being operatively associated with one of said display channels,
each of said plural display channels comprising at least one counter for generating a sequence of digital signals at said preselected repretition frequency in response to said clock signal, display means for sequentially displaying indicia corresponding to said digital signals, at least one latch for transmitting said digital signals to said display means, and latch control means for generating a latch control pulse having a preselected time interval Ti in response to operation of the switch associated with the display channel for causing said latch to halt the sequential transmission of said digital signals to said display means at said preselected repetition frequency and to transmit only one of said digital signals to said display means for said preselected interval of time Ti following operation of said switch associated with the display channel and for causing said latch to resume transmitting said sequence of digital signals to said display means at the end of said preselected interval of time Ti,
said preselected repetition frequency preventing visual recognition of individual indicia displayed by said display means at the preselected repetition frequency,
said preselected interval of time Ti permitting visual recognition of individual indicia displayed by said display means during the preselected interval of Ti, and
said switches and display channels being constructed and arranged such that operation of said switches in sequence causes said plural display channels to simultaneously display said visually recognizable individual indicia during the time that the latch control pulse generated in the display channel associated with the last operated switch and the latch control pulse generated in the display channel associated with the first operated switch overlap.

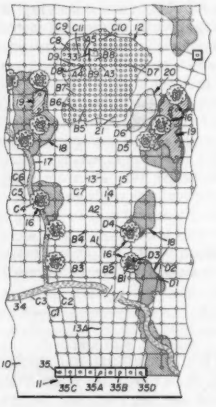
12. A method, comprising:
generating at least one clock signal having a preselected repetition frequency,
generating plural sequences of digital signals each at said preselected repetition frequency in response to said clock signal,
displaying indicia corresponding to each of said plural sequences of digital signals at said preselected repetition frequency, said preselected repetition frequency preventing visual recognition of individual indicia,
successively generating pulses having time intervals T1 and T2 respectively,
successively halting the display of said indicia corresponding to one of said plural sequences of digital signals for a time interval T1 and the display of said indicia corresponding to another of said plural sequences of digital signals for a time interval T2, and
displaying indicia corresponding to one of said digital signals of one of said plural sequences of digital signals and one of said digital signals of another of said plural sequences of digital signals during the time that said preselected intervals of time T1 and T2 overlap, said time during which said intervals T1 and T2 overlap permitting visual recognition of said indicia.

4,277,065

GOLF GAME AND METHOD FOR PLAYING THE SAME

William D. White, 8680 Emard Ter., Sidney, British Columbia, Canada (V8L 1K4)

Filed Sep. 13, 1978, Ser. No. 941,967
Int. Cl.³ A63F 3/00
U.S. Cl. 273—245 **16 Claims**



1. A golf game comprising
a board defining at least one golf hole thereon comprising a tee and a green spaced at a predetermined distance from said tee to simulate a fairway and the yardage therebetween, means simulating an array of hazards on said fairway, said tee including a plurality of laterally spaced tee-off positions,

a coordinate system defined on said board comprising a plurality of first lines extending from said tee to said green and a plurality of second lines disposed transversely relatively to and intersecting at least most of said first lines whereby the point of intersection of each pair of said first and second lines is adapted to simulate the position of a golf ball on said board, each of said tee-off positions located at the termination of one of said first lines on said tee, whereby the position of the said hazards with respect to one of said tee off positions is different from the position of the said hazards with respect to another of said tee positions,

marker means positionable on said board at one of said points of intersection of said first and second pair of lines,

means controlled by a player for randomly displaying information thereon to simulate the distance and direction said marker means must be moved on said board from one of said tee-off positions on said tee to said green,

a sub-coordinate system defined on said green and comprised of a plurality of spaced points with each adjacent pair of such points being spaced-apart at a distance less than an adjacent pair of points of intersection of the first and second lines of said first-mentioned coordinate system, and

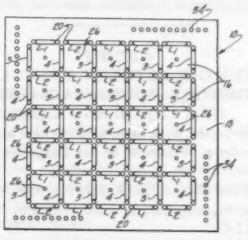
flag means removable and pre-positionable on any one of the points of said sub-coordinate system defined on said green whereby a player may place said marker means at a selected one of said tee-off positions taking into consideration the position of said flag means on said green.

4,277,066

GAME APPARATUS

Sherman C. Hough, 30547 Blairmoor, Madison Heights, Mich. 48071

Filed Nov. 10, 1980, Ser. No. 205,312
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—267 **9 Claims**



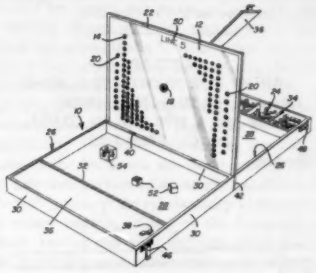
1. Game apparatus comprising: a board having a flat playing surface with a plurality of square playing areas, each of said playing areas having sides designated by four different indicia, a plurality of cards, each having a marking indicating at least one of the sides of each of said squares, said sides designated on said cards being equal in number to the number of sides designated on said board, a plurality of fence elements for disposition on the board in a position on a selected side of a selected square in accordance with the play of a card having a marking corresponding to the indicia of the selected side of said selected square, four of said fence elements being required to surround a square, and player identifying markers coded to identify each player, said markers being disposed within each square upon disposing the fourth fence element in position to surround a given square.

4,277,067

GAME DEVICE WITH BOARD SURFACES VISIBLE ONLY TO OPPOSING PLAYERS

Sara L. Gettleman, 9846 N. Kendall Dr., Apt. A114, Miami, Fla. 33176

Filed Jun. 4, 1979, Ser. No. 45,233
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—271 **9 Claims**



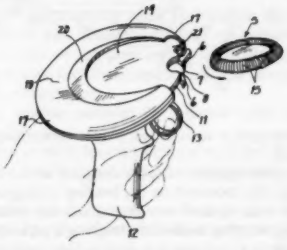
6. A game device comprising a board having playing surfaces visible only to opposing players, visually distinguishable means sequentially rendered operative by opposing players and chance control means comprising dice sequentially actuated by the opposing players to indicate to the opposing players which distinguishable means is to be made operable, said visually distinguishable means including means visible by each of the opposing players whereby operation of the visually distinguishable means may affect the association of the individual visually distinguishable means on both surfaces of the board, and further having trays with hinge means provided for securing said trays to a lower portion of the board for pivotal movement to a position alongside the opposite surfaces of the board, the lower portion of the board projecting below the trays when they are positioned alongside the board with the projecting lower portion of the board including a slot-like handle formed thereon to enable transportation of the game device.

4,277,068

DISK PROJECTOR AND CATCHER

Sei'ichi Sasaki, Goseshi, Japan, assignor to Kabushiki Kaisha Keiheisha, Japan

Filed Oct. 9, 1979, Ser. No. 82,819
Claims priority, application Japan, Mar. 30, 1979, 54-42404[U]
Int. Cl.³ A63B *65/10*
U.S. Cl. 273—324 **6 Claims**



1. A flying saucer toy including a pistol for firing a flying disk, wherein said pistol includes a pair of resilient pinching blades adapted to hold said disk therebetween under compression, one said pinching blade having an opposing corner adja-

cent the free end thereof while the other blade has a slippery corner, said opposing corner and said slippery corner being opposedly located, said opposing corner being adapted to resist a thrust provided by said pinching blades to said disk while said slippery corner is adapted to allow said thrust to pass, thereby enabling a torque to be exerted on said disk as a firing impetus, said pistol further including a pocket defined by a side wall in which said disk can be caught during its flight, said flying disk having an inwardly concave bottom adapted to receive a lift efficiently, and means for releasing said disk from said pinching blades so as to fire said disk.

4,277,069

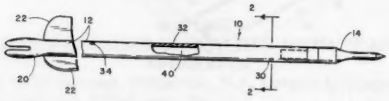
ARROW FOR BLOOD TRACKING

Michael F. Rouse, Rte. 3, Blair, Nebr. 68008

Filed Apr. 4, 1979, Ser. No. 27,072

Int. Cl.³ F41B *5/02*

U.S. Cl. 273—418 **4 Claims**



4. An arrow for blood tracking comprising an elongated tubular shank having a head at one end and a nock at its other end, said shank having a plurality of holes extending therethrough from the exterior of said shank, the inner ends of said holes being in communication with the interior of said shank, the walls of substantially all of said holes being slanted rearwardly toward their outer ends for substantial elimination of whistling noise from said arrow.

4,277,070

PHONOGRAPH

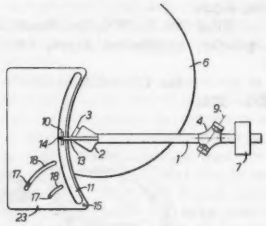
Jack Dinsdale, Carlton; David W. Parkins, Bedford, and John P. Hardwick, Bolton, all of England, assignors to Cranfield Institute of Technology, Cranfield, England

Filed Dec. 28, 1979, Ser. No. 108,300

Claims priority, application United Kingdom, Jan. 9, 1979, 675/79

Int. Cl.³ G11B *3/18*

U.S. Cl. 369—248 **14 Claims**



1. A phonograph record disc player comprising:
a support;
a bearing arrangement fixedly coupled to the support;
a pick-up arm mounted on the bearing arrangement or horizontal and vertical movement on the record disc and having carrying means for attaching a pick-up cartridge to the arm;
first damping means secured to the carry means at a position nearer the carrying means than the bearing arrangement; and
second damping means overlying said disc having means for securing the second damping means to the support, said first and second damping means cooperating to provide damping between the carrying means and the support, for damping a range of frequencies of vertical and horizontal vibrations of the carrying means, whilst allowing free movement over warps and eccentricities of the record disc, thereby to provide relatively low damping for frequencies below 5 Hz, moderate damping between 5 Hz and 20 Hz, and relatively high damping for frequencies above 20 Hz.

4,277,071

DISC RECORDS HAVING SURFACE MARKINGS

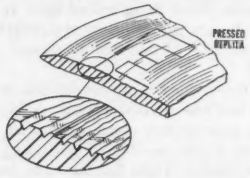
David E. Birt, Hanwell, and Lyn Ho[illegible], Maidenhead, both of England, assignors to E M I Limited, Hayes, England

Filed Feb. 17, 1978, Ser. No. 878,872

Claims priority, application United Kingdom, Feb. 18, 1977, 6845/77

Int. Cl.³ G11B *3/84*

U.S. Cl. 369—84 **1 Claim**



1. A method of making a disc record having a distinctive surface marking including the steps of:
providing a blank lacquer surface,
providing a pattern for forming the said distinctive surface marking,
applying a marking fluid to the pattern and impressing the surface of the lacquer therewith to a depth less than the depth to which recorded information is cut into the lacquer, causing or allowing the removal of the fluid,
cutting such information to be recorded into the lacquer surface,
electroplating the cut lacquer surface to form a stamper and pressing therewith mouldable material into a disc record.

4,277,072

SEAL FOR THE GAP BETWEEN A REVOLVING SHAFT AND THE BORE OF A HOUSING AGAINST A MIXTURE OF A LIQUID AND A GAS

Hans Forch, Birkenau, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,749

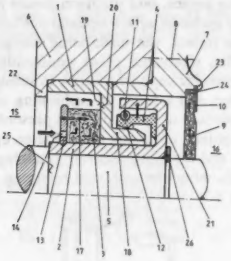
Claims priority, application European Pat. Off., Dec. 15, 1978, 78101712.4

Int. Cl.³ F16J *15/32, 15/38*

U.S. Cl. 277—65 **17 Claims**

1. In a seal for the gap between a rotatable shaft and the bore of a housing, which housing encloses a medium to be retained in said housing, said medium comprising a finely divided liquid entrained in a gas, wherein an inner ring is secured to the shaft and an outer ring is secured to the bore of the housing in a liquid- and gas-tight manner, and having a radially-movable, ring-shaped sealing lip secured to said inner ring and biased into contact with a surface of said outer ring, the improvement which comprises a flange means secured to said inner ring at a point between the medium to be retained and the sealing lip; said flange means having an inner end face, an outer end face, and an outer circumferential surface, said outer end face of said flange means being biased into contact with a ring-shaped surface of said outer ring, said flange means also having openings distributed over the inner end face of said flange, which

openings are connected by passages extending generally axially through said flange means, said flange means further having a multiplicity of openings on said outer circumferential surface which openings are connected to said axial passages by passages extending in a generally radial direction.

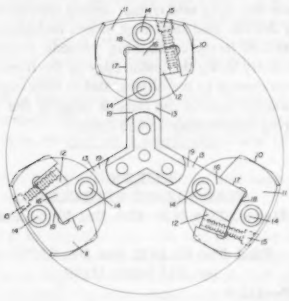


4,277,073

INSERT TYPE SOFT CHUCK JAWS

Lyndel G. Ferguson, Comanche, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 9, 1979, Ser. No. 82,845
Int. Cl.³ B23B *31/16*
U.S. Cl. 279—1 SJ **4 Claims**



1. A soft chuck jaw adapted to engage the chuck of a machine tool comprising:

hardened jaw body means including:

base portion means;

upper portion means having a substantially U-shaped opening therein, wherein the substantially U-shaped opening comprises:

first side wall means;

second side wall means angularly disposed with respect to the first side wall means; and

bottom wall means having a portion thereof disposed substantially perpendicular with respect to the first side wall means and having the remaining portion thereof disposed substantially perpendicular with respect to the second side wall means;

lug means disposed on the bottom of the base portion of the hardened jaw body means adapted to engage the chuck of a machine tool;

recess means disposed between the lug means disposed on the bottom of the hardened jaw body means;

aperture means located in the remaining portion of the bottom wall means of the upper portion means, the aperture means being disposed substantially parallel to the second side wall means of the substantially U-shaped opening in the upper portion means;

aperture means extending through the base portion means and one of the lug means disposed on the bottom of the base portion means;

aperture means extending through the raised portion means, through the base portion means, and through one of the lug means disposed on the bottom of the base portion means; and

aperture means located in the recess means disposed between the lug means disposed on the bottom of the hardened jaw body means, extending into the base portion means and having thread means on a portion thereof;

wedge locking means slidably engaging the second wall means of the substantially U-shaped opening in the raised portion of the hardened jaw body means, the wedge locking means comprising:

wedge shaped means having a first side wall portion substantially parallel to the first side wall means of the substantially U-shaped opening in the raised portion means in the hardened jaw body means, having a second side wall portion substantially parallel to the second side wall means of the substantially U-shaped opening in the raised portion means of the hardened jaw body means, having end wall portions substantially parallel with respect to each other, having top and bottom wall portions substantially parallel with respect to each other, and having aperture means therein substantially parallel to the second side wall means of the substantially U-shaped opening in the raised portion means of the hardened jaw body means;

soft jaw insert means releasably retained in the substantially U-shaped opening in the raised portion means of the hardened jar body means, the soft jaw insert means comprising:

substantially rectangular body means having one end portion releasably retained in the substantially U-shaped opening of the raised portion means of the hardened jaw body means by the wedge locking means while the other end thereof extends beyond the raised portion means of the hardened jaw body means whereby the soft jaw insert means is releasably clampingly engaged by the wedge locking means and the hardened jaw body means; and

fastening means releasably securing the wedge locking means to the raised portion means of the hardened jaw body means and extending through the aperture means located in the raised portion means of the hardened jaw body means into the aperture means in the wedge locking means.

4,277,074

KEYLESS CHUCK

Harry Kilberis, 4411 Stallion Brook La., Spring, Tex. 77379

Filed Nov. 26, 1979, Ser. No. 97,366
Int. Cl.³ B23B *31/06, 31/16*
U.S. Cl. 279—60 **14 Claims**

1. In a chuck for grasping tools for rotation about an axis with a plurality of jaws, wherein said jaws are radially movable in response to relative rotational movement between a chuck collar and said jaws for changing said tools in said chuck, the improvement comprising:

a first dog member secured for rotation with said chuck collar,

a second dog member located adjacent said first dog member and adapted to be secured against rotation with said chuck collar,

said first and second dog members having tapered engaging surfaces for producing an axial force separating said dog members when said second dog member is secured against rotation while said chuck collar is rotating,

guide means for allowing axial movement of said first dog member relative to said chuck collar in response to said axial force, and

resilient means for opposing said axial force and yielding to

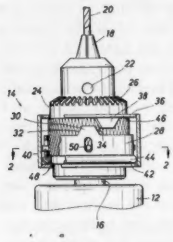
allow said first dog member to pass by said second dog member.

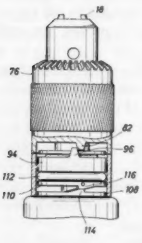
7. In a chuck for grasping tools for rotation about an axis with a plurality of jaws, wherein said jaws are radially movable in response to relative rotational movement between a chuck collar and said jaws for changing said tools in said chuck, the improvement comprising:

a first dog member secured for rotation with said chuck collar,

a second dog member located adjacent said first dog member and adapted to be secured against rotation with said chuck collar,

said first and second dog members having tapered engaging surfaces for producing an axial force separating said dog





members when said second dog member is secured against rotation while said chuck collar is rotating,

guide means for limiting rotational movement of said second dog member and allowing for axial movement of said second dog member relative to said chuck collar in response to said axial force,

resilient means for opposing said axial force and yielding to allow said first dog member to pass by said second dog member,

positioning means for axially moving said second dog member toward said first dog member to allow for engagement of said dog members, and

a sleeve member enclosing said second ring member and said positioning means.

4,277,075

MOVING DOLLY

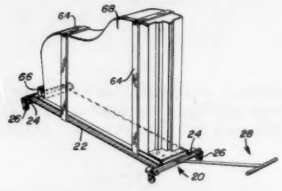
Robert W. Shay, 501 SW. Second St., Hallandale, Fla. 33009

Filed Mar. 27, 1979, Ser. No. 24,325

Int. Cl.³ B62B *3/02, 3/04, 3/10*

U.S. Cl. 280—47.36 **6 Claims**

1. A moving device for transporting a bulky object having greater width and height than depth, comprising, in combination, platform means for supporting the object in a generally vertical plane and framework means for supporting the platform means during transport of the object, said framework means comprising retaining means for holding the platform means, wheel means attached to the retaining means for permitting movement in any direction, handle means attached to the retaining means for manually pulling the device, and pivot means for pivotal movement of the handle means and for detachably attaching the handle means to a selectable location on the retaining means, said platform means including a cushioning element surfaced with a resilient cushioning material for supporting the object, the cushioning element comprising a substantially flat, elongated plank conforming in size to the framework means for support thereby in substantially horizontal configuration and a layer of cushioning material attached on the upper surface of the plank and presenting a contacting surface to the object, the plank including an upraised retaining portion at one end for more securely retaining the object resting on the cushioning element, said retaining means including



a pair of substantially parallel longitudinal frame members having inwardly projecting flanges for supporting the cushioning element, the retaining means further comprising a pair of substantially parallel end supports attached to the longitudinal frame members for further support of the cushioning element, said cushioning element including fastening means for passing upwardly and securing said object during transport thereof by the moving device, said fastening means including a plurality of straps attached to the cushioning element, at least one strap passing upwardly along the inside edge of the frame member in securing relationship to the object, and at least one other strap passing upwardly around the outside edge of the frame member in securing relationship to the object.

4,277,076

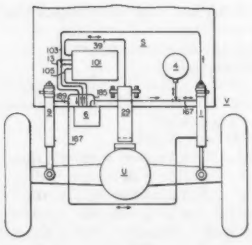
STABILIZING VEHICLES

Clinton R. Hanna, 2756 N.E. 37th Dr., Fort Lauderdale, Fla. 33308

Filed Jun. 12, 1979, Ser. No. 47,792

Int. Cl.³ B60G *11/30*

U.S. Cl. 280—112 A **14 Claims**

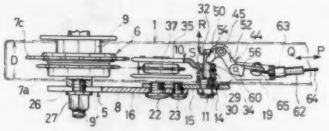


6. In a hydropneumatic suspension for a vehicle having sprung and unsprung masses, a source of hydraulic power, hydraulic actuators for supporting the sprung mass of said vehicle from said unsprung mass, means for supplying pressure to said actuators from said power source, and positive mechanical means for supporting said sprung mass when said power source is idle, and means connected to said mechanical supporting means for enabling said supporting means when said source is idle and means connected to said mechanical supporting means for disabling said supporting means when said source is operative.

4,277,077
VARIABLE-SPEED BICYCLE

Nobuo Ozaki, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Jun. 25, 1979, Ser. No. 51,396
Claims priority, application Japan, Jul. 5, 1978, 53-82340; Jul. 5, 1978, 53-93247[U]
Int. Cl.³ B62M *9/12, 25/04*
U.S. Cl. 280—236 11 Claims



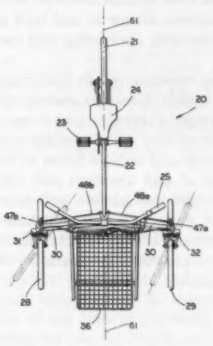
1. A variable-speed bicycle having a gear case mounted to one side of a bicycle frame, said bicycle comprising:
- a multi-stage freewheel assembly housed within said gear case;
- said freewheel assembly having at least two sprockets of different diameter mounted on a rear wheel hub of said bicycle;
- a rear derailleur housed within said gear case;
- said derailleur having a tensioner, a pulley support frame formed integral with said tensioner, and a pair of pulleys rotatably supported by said pulley support frame;
- said derailleur being adapted to cooperate with said freewheel assembly for switching over a drive chain from one sprocket to another sprocket when said tensioner is shifted by operation from a remote location by means of a speed change lever through a control cable both of which are mounted on said bicycle frame;
- said derailleur including a substantially horizontal support shaft disposed within said gear case and extending transversely with respect to a longitudinal axis of said gear case;
- said tensioner being axially slidable on said support shaft as well as rotatable about said support shaft;
- at least one helical spring surrounding said support shaft and engaged at its movable end with said tensioner to bias said tensioner to slide on said support shaft axially outwardly as well as to impart a torsional force to said tensioner to urge the tensioner to rotate about said support shaft in one direction;
- said derailleur further including an action converter for converting an axial tension force imparted in a first direction by said control cable into a thrust force acting in a second direction transverse to said first direction of said tension force; and
- said action converter having at least one push arm connected at its one end to said control cable and arranged to be in contact at its free end with said tensioner to selectively position said tensioner on said support shaft in accordance with said tension force imparted by said control cable.

4,277,078
THREE-WHEEL CONVEYANCE

Myron A. Root, P. O. Box 398, Milroy, Ind. 46156

Filed Feb. 22, 1979, Ser. No. 14,106
Int. Cl.³ B62K *5/02, 5/08*
U.S. Cl. 280—269 6 Claims

1. A three-wheel conveyance comprising:
- an integral frame member including a rear wheel support and a front center post;
- handlebars assembled to said front center post;
- a rear wheel retained by said rear wheel support;
- a wheel fork support assembly clamped about said center post and including two wheel forks, each arranged with a center pivot stem and a positive camber and located at opposite ends of said wheel fork support assembly;
- two front steering wheels, each wheel being retained by a different one of said two wheel forks;
- a center steering assembly comprising:
  - (a) a handlebar bracket attached to said front center post and retaining said handlebars for steering said three-wheel conveyance; and
  - (b) a center steering link rigidly joined to said handlebar bracket;
- two pivot links, one link being rigidly attached to the top of said center pivot stem of each wheel fork;

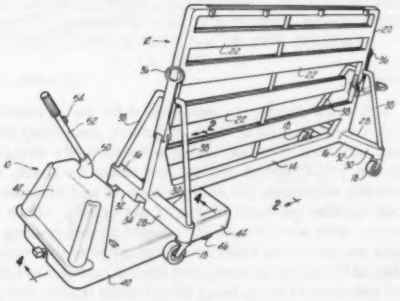


- a first connecting rod connecting together one of said two pivot links with a first side of said center steering link;
- a second connecting rod connecting together the other of said two pivot links with a second opposite side of said center steering link, said connecting rods in combination with said center steering link transferring steering motion from said handlebars to said two front steering wheels; and
- a plurality of spherical connectors arranged for providing the connections at each end of said two connecting rods.

4,277,079
MATERIAL HANDLING SYSTEM

Robert L. Propst, Bellvue, Wash., and Paul L. Propst, Ann Arbor, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Oct. 4, 1979, Ser. No. 81,687
Int. Cl.³ B60D *1/16;* B62D *53/00*
U.S. Cl. 280—411 R 9 Claims



1. In a material handling system,
- a transport unit having a load-carrying body portion, end portions extending transversely of said body portion and

ground wheels secured to said end portions and arranged in substantially spaced pairs thereon,

a transport vehicle having a frame and ground-engaging drive wheels,

coacting means on said vehicle frame and one of said transport unit end portions at a position between the pair of wheels thereon operable to releasably connect said frame and said end portion for controlled movement of said transport unit in response to movement of said vehicle,

said vehicle frame comprising a front section and a back section, said back section being located so that said vehicle can be moved toward said transport unit to a position in which said back section underlies said end portion,

coacting abutment means on said back section and said end portion releasably connecting said frame to said end portion,

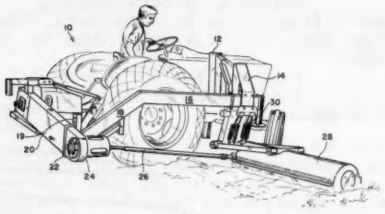
said coacting abutment means comprising projection means on said vehicle frame extending upwardly therefrom, means forming a recess in said transport unit end portion operable to receive said projection means upon horizontal movement of said vehicle frame to thereby limit relative movement of said transport unit and said vehicle, and means on said end portion and said frame operable to retain said projection means in said recess in the connected positions of said vehicle and frame and said transport unit and to restrict articulation of said transport unit and said vehicle.

4,277,080

QUICK HITCH POWER FRAME

Alexander Smith, and Burton D. Baggs, both of Sanford, Fla., assignors to Smitty's, Inc., Sanford, Fla.

Filed Mar. 16, 1978, Ser. No. 887,830
Int. Cl.³ B60D *1/14*
U.S. Cl. 280—473 **8 Claims**



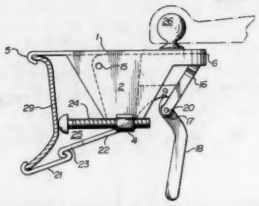
1. A quick disconnect arrangement for use in combination with a tractor or other farm implement, comprising an elongate structural member having a substantially straight mid portion, and front and rear support means for rigidly yet removably supporting the entire weight of said elongate structural member outboard of one of the driving wheels of the tractor, with said substantially straight portion residing essentially parallel to the longitudinal centerline of the tractor and adapted to support an implement thereon, portions of said front and rear support means being affixed to the tractor, and having quick disconnect means operatively associated with said elongate structural member, each end of said elongate structural member being readily releasable from support by the tractor by operation of said quick disconnect means.

4,277,081

BUMPER TRAILER HITCH

Garnet H. Stoutenburg, 1411 - 19 Ave., NW., Calgary, Alberta, Canada

Filed Jul. 31, 1979, Ser. No. 62,427
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—502 **6 Claims**



1. A trailer hitch for mounting on the bumper of a vehicle comprising

(a) a main hitch member carrying a hitch ball and having a bumper catch thereon at one end, the bumper catch being capable of attaching to and gripping the upper edge of the bumper of the vehicle;

(b) a pivot member pivotally connected to the main hitch member;

(c) a second bumper catching means connected to the pivot member, said bumper catching means being capable of attaching to and gripping the lower edge of the bumper of the vehicle and permitting the distance between the bumper catching means and the pivot member to be adjusted;

(d) two adjustable length bumper legs fitted into two respective leg holders mounted on either side of the main hitch member, the two bumper legs permitting the distance between the bumper and the hitch member to be adjusted;

(e) a hand lever pivotally engaging with the pivot member, and a fork hinge pivotally engaging with the main hitch member, the handle lever and the fork hinge being pivotally interconnected with one another whereby pivoting said hand lever about said pivoted interconnection with the fork hinge rotates said pivot member to provide a mechanical advantage and enable the second bumper catching means to be tensioned against the lower edge of the bumper while the bumper catch of the main hitch member is secured to the upper edge of the bumper of the vehicle and the two bumper legs support the hitch on the bumper.

4,277,082

SKI BRAKE

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Division of Ser. No. 815,364, Jul. 13, 1977, abandoned. This application Aug. 27, 1979, Ser. No. 70,031
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632849
Int. Cl.³ A63C *7/10*
U.S. Cl. 280—605 **7 Claims**

1. A ski brake for use on a ski having a snow-engaging lower surface and a boot-carrying upper surface and normally adapted to travel forwardly in a predetermined travel direction, said ski brake comprising:

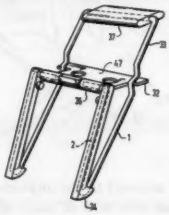
a pivot on said ski defining an immovable pivot axis fixed relative to said ski and extending generally parallel to said surfaces and transverse to said direction;

an abutment fixed and offset on said ski in said direction from said pivot axis;

a brake element having a guided leg having one end bearing in said direction on said abutment and a pivot leg having one end pivoted in said pivot about said pivot axis, said

legs having opposite joined-together other ends, said brake element being displaceable with sliding of said one end of said guided leg longitudinally of said guided leg over said abutment between a braking position with said legs extending transversely to said direction and downwardly below said lower surface into snow underneath said ski and a rest position with said legs extending generally parallel to said direction and lying above said surfaces;

means including an actuator connected to one of said legs



and displaceable between an advanced position relatively far from said upper surface and a depressed position relatively close to said upper surface and spaced from said advanced position for displacing said braking element from said braking into said rest position on displacement of said actuator from said advanced into said depressed position; and

spring means on said element for urging same into said braking position, for urging said one end of said guided leg in said direction against said abutment, and for urging said actuator into said advanced position.

4,277,083

SAFETY SKI BINDING

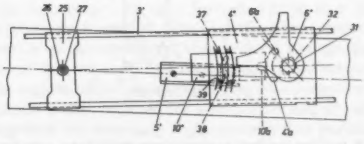
Alois Himmetsberger, and Heinz Wittmann, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Division of Ser. No. 896,234, Apr. 13, 1978, Pat. No. 4,190,264. This application Nov. 5, 1979, Ser. No. 91,434

Claims priority, application Austria, Apr. 15, 1977, 2635/77

Int. Cl.³ A63C 9/081

U.S. Cl. 280—618 **7 Claims**



1. A safety ski binding comprising a pivotally supported sole plate provided adjacent a front end thereof with a jaw plate having a holding jaw pivotally supported for movement about an axis which is perpendicular with respect to an upper surface of a ski, said sole plate being maintained in a centered position at said front end by means of a locking mechanism which is released upon exceeding a predetermined torque, the improvement comprising wherein said locking mechanism has a mounting plate secured to said ski, said jaw plate having means defining an elongated track thereon, the longitudinal axis of said track extending parallel to the longitudinal axis of said sole plate, slide piece means slidably mounted on said track for reciprocal movement thereon, said holding jaw having extension means thereon, releasable connecting means operatively connecting said extension means to said slide piece means without restricting the reciprocal movement capability of said slide piece means and operatively effecting a locking of said holding jaw in a fixed position on said jaw plate, and means responsive to a pivotal movement of said sole plate for effecting a movement of said slide piece means and a resulting release of said connecting means to thereby unlock said holding jaw from said jaw plate to permit a pivotal movement of said holding jaw on said jaw plate.

4,277,084

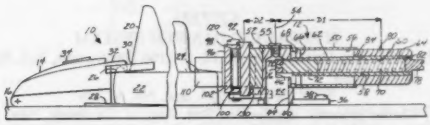
ACCELERATION COMPENSATED STEP-IN SKI BINDINGS

Duane J. Bonvallet, 375 Becket, Brighton, Mich. 48116

Filed Jun. 11, 1979, Ser. No. 46,993

Int. Cl.³ A63C 9/08

U.S. Cl. 280—629 **10 Claims**



1. An acceleration compensated ski boot release device for a safety ski binding comprising:

a support member adapted to be fixably mounted to a ski;

a body member pivotally carried by said support member for movement about a first pivot point;

means, carried by said body member, for releasably connecting a first portion of said boot to said body member;

means for maintaining the fulcrum length between the effective acting point of the mass of said boot and said first pivot point constant regardless of where said first portion of said boot engages said boot connecting means;

a mass; and

means, for connecting said mass to said body member such that said mass and said body member pivot together as a unit about said first pivot point and the center of gravity of said mass is disposed on the opposite side of said first pivot point from the mass of said boot to generate a moment at said first pivot point equal and opposite to the moment generated by said boot mass during acceleration of said boot to cancel the internal acceleration forces generated by said boot mass.

4,277,085

TRANSPORT VEHICLE

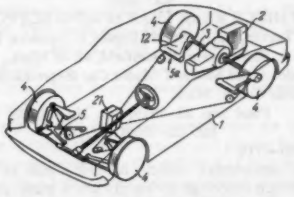
Jury A. Bryansky, Leningradskoe shosse, 61-63, kv. 67; Stanislav B. Gess de Kalve, ulitsa Fersmana, 11, kv. 13, and Igor V. Ermilin, Brigadirsky pereulok, 3-5, kv. 92, all of Moscow, U.S.S.R.

Filed Nov. 29, 1978, Ser. No. 964,501

Claims priority, application U.S.S.R., Nov. 30, 1977, 2546950; Apr. 28, 1978, 2611956; May 30, 1978, 2621560; May 31, 1978, 2624801; Jun. 8, 1978, 2624401; Sep. 26, 1978, 2662301

Int. Cl.³ B62D 7/00

U.S. Cl. 280—660 **13 Claims**



1. A transport vehicle comprising a sprung mass and unsprung masses, suspensions coupling said mass through said unsprung masses so that said unsprung masses can move inde-

pendently in a vertical direction with respect to said sprung mass over a predetermined range between limits on said sprung mass; each of said suspensions comprising a resilient element and arms, the ends of which are hingedly connected to an unsprung mass while their other ends are connected to said sprung mass and are capable of moving in a vertical direction over a limited range; said resilient elements located on said sprung mass in a unit for said resilient elements arranged on said sprung mass; and a plurality of flexible elements, each coupling one of said resilient elements with an unsprung mass; and said flexible elements being under tension over the entire range of the vertical movement of an unsprung mass with respect to said sprung mass due to a pretightening or preloading of the resilient elements.

4,277,086

HYDRAULIC DAMPER SYSTEM

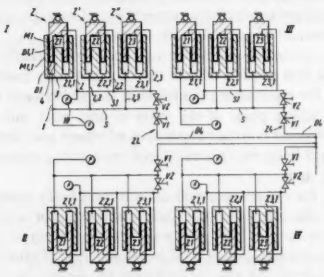
Horst Thiele, Friedhofstrasse 12, D-7106 Neuenstadt, Fed. Rep. of Germany

Filed Jul. 30, 1979, Ser. No. 62,229

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1978, 2851324

Int. Cl.³ B60G *19/06*

U.S. Cl. 280—709 **3 Claims**



1. A support and safety arrangement for a hydraulic damper system supporting a trailer on a wheel axle at one end thereof, comprising a unit of pairs of cooperating cylinders, each cylinder having a piston with a pressure face, the pressure faces of the pistons of the cylinders of each pair having substantially the same area and each pressure face delimiting an operating chamber in the respective cylinder, the operating chambers of the cylinders of each pair being separated from each other in a fluid-tight manner, two separate conduits each containing a metered amount of hydraulic fluid, each conduit connecting the operating chambers of the respective cylinders, and a shut-off valve in each conduit for selectively permitting delivery of the metered amounts of hydraulic fluid to each separate conduit and for discontinuing the hydraulic fluid delivery and locking the metered amounts of hydraulic fluid in each conduit.

4,277,087

VEHICLE REAR LEAF SPRING SUPPORT

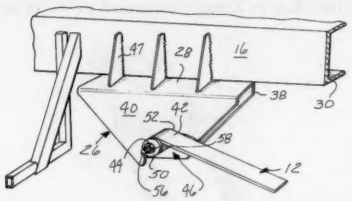
Nelson R. Turner, Battle Creek; Daniel E. Sanders, Lansing, and Charles A. Bienenstein, Bloomfield, all of Mich., assignors to The Model A and Model T Motor Car Reproduction Corporation, Battle Creek, Mich.

Filed Sep. 28, 1979, Ser. No. 79,998

Int. Cl.³ B60G *11/04*

U.S. Cl. 280—718 **1 Claim**

1. In an automotive vehicle having a pair of side frame elements which converge forwardly and a transverse rear axle underlying the frame elements adjacent the rear ends thereof, a suspension for the rear axle comprising an open-bottomed mounting box suspended beneath each of the frame elements forwardly of the axle and having spaced vertical side walls, each mounting box being angularly related to the overlying frame element so that each of the box sidewalls is perpendicular to the axis of the axle, a transverse mounting bolt projecting across each said box below the frame elements and parallel to the axis of the axle, a pair of parallel, longitudinally extending leaf springs supporting the rear axle, each leaf spring having its forward end lying between the side walls of the associated



mounting box and secured to the adjacent mounting bolt, and means securing the rear end of each of said springs to the adjacent frame element in longitudinal alignment with the front end of the respective spring, so that the springs are retained in parallel relation and are guided for movement in a plane which is truly perpendicular to the axis of said axle regardless of the convergence of the side frame elements.

4,277,088

PASSIVE SEATBELT SYSTEM

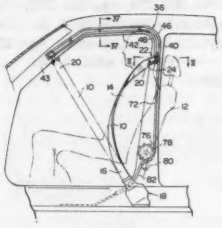
Ichiro Suzuki, Nagoya; Masanao Motonami, and Hisashi Ogawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 25, 1979, Ser. No. 33,054

Claims priority, application Japan, Aug. 17, 1978, 53-113244[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **11 Claims**



11. A passive seatbelt system comprising for a vehicle which includes a guide rail fastened to a vehicle body, a runner piece which is provided in said guide rail and moves along the length of said guide rail and a driving mechanism which moves said runner piece along the length of said guide rail, said seatbelt system further comprising:

a sliding shoe provided between said runner piece and said guide rail, said sliding shoe comprising grooves formed on the edge thereof and portions of said guide rail being inserted into said grooves such that the sliding shoe guides the movement of said runner piece;

a pair of projections formed on said runner piece through which said runner piece is coupled to said driving mechanism by engaging with a transmitting tape;

a pair of slide projections formed on said runner piece on the other side opposite to said pair of projections whereby said runner piece contacts said guide rail via said slide projections; and

an anchor shaft attached to said runner piece, said anchor shaft projecting through said guide rail to the inside of the

vehicle for anchoring the outer end of a passenger restraining belt, whereby the movement of said runner piece is prevented in a lateral direction of the vehicle.

4,277,089

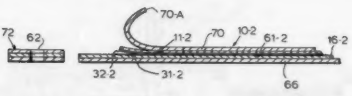
PHARMACEUTICAL RECORD AND LABEL SYSTEM

James L. Lockhart, 1645 E. 50th St., Chicago,, Ill. 60615

Continuation-in-part of Ser. No. 831,818, Sep. 9, 1977, Pat. No. 4,159,129. This application Jan. 29, 1979, Ser. No. 7,217

Int. Cl.³ G09F *3/10*; B41L *1/32, 1/36*

U.S. Cl. 282—27 R **1 Claim**



1. A record and label system for computerized pharmaceutical accounting, comprising:

unitary information storage means comprising a top information storage sheet storing information in readable form as ink characters, relative to pharmaceutical prescriptions, transferred thereto by means of ink character impressions which apply the ink directly to said top information storage sheet,

a series of adhesively backed pharmaceutical prescription label segments secured to said information storage means in underlying relation to said top information storage sheet, while permitting manual stripping of the label segments with adhesive backing intact from said information storage means, said label segments each having label information receiving locations thereon for receiving information concerning a pharmaceutical prescription,

said top information storage sheet having formatted zones thereon corresponding in location to said label information receiving locations so as to be in direct alignment therewith, for facilitating entry of said ink character impressions directly to the portions of said top storage sheet overlying said label information receiving locations of said label segments, and having supplemental data segments providing for recording of supplementary information with respect to each formatted zone at a location adjacent the formatted zone, such that after entry of information on the top storage sheet, the top storage sheet has stored thereon at each of a succession of unified identifiable regions of the top storage sheet both formatted information as also required for a respective one of said label segments and necessary supplementary data pertaining to a given prescription,

said information storage means having character impression transfer means interposed between said top storage sheet and said series of label segments with said top storage sheet overlying all of said pharmaceutical label segments such that ink character impressions applied to said top storage sheet are transferred to said label segments,

said top storage sheet having means providing exterior machine readable surface portions at said formatted zones for retaining said ink characters in machine readable form which ink characters are at the same time in the form of visually readable conventional characters, said top storage sheet being of opaque paper stock with the identical information which is transferred to said label segments by means of said character impression transfer means, being present in said formatted zones of said top information storage sheet, and being readable by both optical character reading equipment and by personnel processing such top storage sheet.

4,277,090

MUSIC SCORING AND MUSICAL STAFFS

Domenico F. Lusi, 427 Cedarville St., Pittsburgh, Pa. 15224

Continuation of Ser. No. 643,710, Dec. 23, 1975, abandoned, which is a continuation of Ser. No. 137,126, Apr. 26, 1971, abandoned. This application Nov. 22, 1978, Ser. No. 963,096

Int. Cl.³ G10G *1/00*

U.S. Cl. 283—47 **8 Claims**

1. A composite musical staff for receiving musical notes comprising at least two sets of five equally spaced lines each, said at least two sets of five equally spaced lines forming at least one of a composite bass and treble clef staff, a composite bass clef staff, a composite treble clef staff, a composite multiple treble clef and multiple bass clef staff, a composite multiple treble clef and single bass clef staff, and a composite single treble clef and multiple bass clef staff, the at least two sets of five equally spaced lines forming said composite treble and bass clef staff being separated by one line and two spaces, the at least two sets of five equally spaced lines forming the composite bass clef staff being separated by two lines and three spaces, the at least two sets of five equally spaced lines forming the composite treble clef staff being separated by two lines and three spaces, the composite multiple bass clef and multiple treble clef staff having at least two sets of five equally spaced lines separated by two lines and three spaces forming the multiple treble clef portion of the staff separated from at least two sets of five equally spaced lines forming the multiple bass clef portion of the staff by one line and two spaces and the at least two sets of five equally spaced lines forming the multiple bass clef portion of the staff being separated by two lines and three spaces, the composite multiple treble clef and single bass clef staff having at least two sets of five equally spaced lines forming the multiple treble clef portion of the staff separated from a set of lines forming the bass clef portion of the staff by one line and two spaces and the at least two sets of lines forming the treble clef portion being separated by two lines and three spaces, and the single treble clef and multiple bass clef staff having a set of five equally spaced lines forming the treble clef portion of the staff separated from at least two sets of five equally spaced lines forming the multiple bass clef portion of the staff by one line and two spaces and the at least two sets of lines forming the bass clef portion of the staff being separated from each other by two lines and three spaces.

4,277,091

COUPLING FOR LINED PIPE

John J. Hunter, 1410 Willow Pond, Abilene, Tex. 79602

Continuation-in-part of Ser. No. 31,533, Apr. 19, 1979, abandoned. This application Jun. 11, 1979, Ser. No. 47,151

Int. Cl.³ F16L *9/14, 13/14*

U.S. Cl. 285—55 **18 Claims**

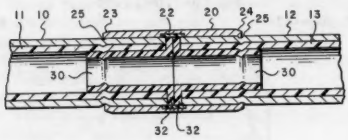
1. A coupling joint interconnecting two lengths of metal pipe comprising:

(a) first pipe means having a plastic liner on the internal surface thereof, the end face of said plastic liner substantially coterminous with the end face of said pipe means;

(b) an end face collar comprising a tubular plastic body, the external diameter thereof substantially conforming to the internal diameter of said liner in said first pipe means and having a radially extending flange at one end thereof, said end face collar positioned within the open end of said first

pipe with said radially extending flange adjacent the end face of said first pipe means; and

(c) second pipe means having an internal diameter at the open end thereof less than the external diameter of said first pipe means and having a plastic liner on the internal



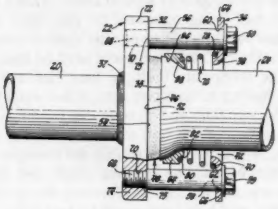
surface thereof, the end of said plastic liner terminating within said second pipe means at a point removed from the open end thereof, wherein the end of said first pipe means is telescopically interference fit within the open end of said second pipe means and said radially extending flange overlaps said plastic liner in said second pipe means.

4,277,092

SUPPLE EXHAUST COUPLING

Homer J. Viers, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 19, 1979, Ser. No. 58,789
Int. Cl.³ F16L *27/04*
U.S. Cl. 285—263 **3 Claims**



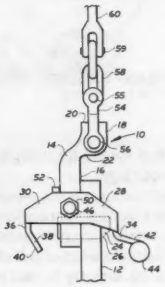
1. A flexible exhaust coupling assembly for maintaining a uniformly biased circumferential seal between exhaust flow segments subject to angular movement therebetween during exhaust flow therethrough comprising: an exhaust component having an exteriorly located spherical seal surface and an exhaust flow path therethrough, a pair of spaced bolts fixedly secured to said exhaust component and extending axially therefrom on either side of said spherical seal surface, head portions on each of said bolts located in spaced relationship to said exhaust component, a pipe having a flared free end formed continuously circumferentially therearound, said flared free end having a spherical outer surface and a spherical inner surface thereon, a spacer flange, means securing said spacer flange to said bolts at a point located in axially spaced relationship to said flared free end and having a center hole therein receiving said pipe and spaced therefrom radially to permit equally free universal angular movement of said pipe with respect to said exhaust component, and also with respect to said spacer flange, a spring retainer ring having a spherical surface thereon slidably supported for floating movement on said outer spherical seal surface, a coil spring surrounding said pipe having opposite ends thereon in engagement with said spacer flange and said retainer ring for biasing said retainer ring axially against said spherical outer surface and said retainer ring assuming an equilibrium position on said spherical outer surface to uniformly force said pipe against said spherical seal surface, said coil spring being spaced with respect to said pipe to permit angular movement thereof with respect to said exhaust component, said coil spring biasing said flared free end with respect to said spherical seal surface when the retainer ring is in its equilibrium position to maintain a uniformly continuous circumscribing spring pressure force therearound throughout the range of angular movement between said exhaust component and said pipe.

4,277,093

SAFETY HOOK DEVICE

Bernard C. Turley, Pittsburgh, and David E. Hochbein, Sarver, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 17, 1979, Ser. No. 76,213
Int. Cl.³ B66C *1/36*
U.S. Cl. 294—83 R **3 Claims**



2. A hook device for attachment to an overhead transporting means and adapted for automatic uncoupling from a coupled object comprising:

(a) a vertical frame member having an upper portion adapted for attachment to an overhead transporting means and a coupling rod projecting generally horizontally from a lower portion of said frame member for inserting into an opening in an object to be transported;

(b) a housing pivotally attached to said frame member about a horizontal axis and having a first portion enclosing at least a portion of said coupling rod for retaining a coupled object on said coupling rod extending outward from said horizontal axis in imbalance with a second portion extending outward from said horizontal axis in the opposite direction and having said enclosing portion heavier than said second portion; and a stop means for preventing gravitational rotation of said housing about said horizontal axis when said enclosing portion encloses said coupling rod.

4,277,094

DEVICE FOR THE REMOTE-CONTROLLED CLOSING OF A GASOLINE VENT

Yves Roue, Foyer de Puteaux, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 7, 1979, Ser. No. 73,292
Claims priority, application France, Sep. 22, 1978, 78 27172
Int. Cl.³ B60K *15/04*
U.S. Cl. 296—1 C **4 Claims**

1. A remote control gasoline vent closing device for a motor vehicle, comprising:

a vent cup;

a vent portal for the vent cup, said vent portal including an interior keeper fixed thereto;

an activator mounted inside the body of said motor vehicle, said activator including a movable core;

a hollow guide means passing through said vent cup;

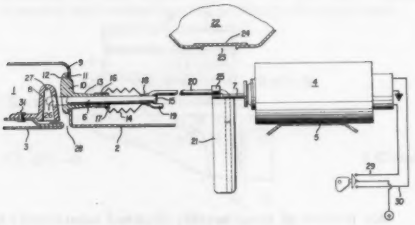
a bolt having one end fixed to said movable core and having another end inserted in said hollow guide means to lock said interior keeper; and

at least one gasoline vapor retaining means attached between said hollow guide means and said bolt; wherein said guide

means is a perforated plug obstructing an opening of said cup and extended in the direction of said activator by a sleeve surrounding said bolt and wherein said gasoline vapor retaining means is an elastic bellows having a collar at each end, one of said collars fits tightly around the end of said sleeve, said sleeve including a retaining flange, and the second of said collars fits tightly around said one end of said bolt.

2. A remote control gasoline vent closing device for a motor vehicle, comprising:

an activator mounted inside the body of said motor vehicle, said activator including a movable core;



a vent portal including an interior keeper affixed thereto, said interior keeper comprising a stirrup connected to a tapered blind housing having a stud hole thereon; and

a bolt having one end fixed to said movable core and movable by said core from an extended position into a retracted position, and having another end insertable into said stud hole to lock said vent portal, whereby said blind housing encloses said other end of said bolt to prevent tampering therewith and said taper of said blind housing permits the closing of said vent portal when said bolt is in said extended position.

4,277,095

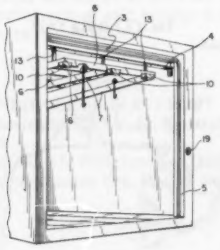
TRUCK RAILS AND TIME SAVER

Jacob Barruw, 367 Fern Dr., Ft. Lauderdale, Fla. 33326

Filed Dec. 12, 1977, Ser. No. 859,666

Int. Cl.³ B62D *33/04*

U.S. Cl. 296—24 B **4 Claims**



1. An improved meat rack for use in a mobile transportation compartment having an overhead door on at least the unloading end which travels in guide rails longitudinally adjacent the roof of the compartment in a plane parallel to the roof when the door is opened and closed either manually or by a prime mover, comprising:

a plurality of first elongated members attached to the sides of said compartment transverse of the longitudinal axis thereof and below said roof thereof;

a plurality of spacers attached to said first elongated members, said spacers projecting downwardly therefrom;

a plurality of second elongated members attached to said spacers and disposed transverse of said first elongated members;

a plurality of third elongated members, each said third elongated member attached to said roof and disposed in parallel, coplanar relation with a respective second elongated member;

a plurality of meat hooks, each said meat hook movably connected to a respective second elongated member, each said meat hook movable in a longitudinal direction with respect to said compartment;

a plurality of cam means, each said cam means for preventing longitudinal movement of a respective meat hook in one direction each said cam means pivotally connected to a respective third elongated member and extending downwardly therefrom into the path of a respective meat hook and the path of said overhead door;

a plurality of stop means, each said stop means for preventing rotational movement of a respective cam means in one direction, each said stop means attached to a respective third elongated member, adjacent a respective cam means;

a plurality of biasing means, each said biasing means for biasing a respective meat hook from longitudinal movement in one direction, each said biasing means spaced a predetermined distance from a respective cam means to allow the portion of said meat hook which is movably connected to said respective second elongated member to fit therebetween;

said overhead door having a top edge which when the door is opened contacts each said cam means forcing said cam means to rotate in a direction against a respective meat hook, causing each said meat hook to move longitudinally in the direction of said top edge overcoming the force of said biasing means, allowing further rotational movement of each said cam means out of the path of each said meat hook and the path of said overhead door, allowing longitudinal movement of each said meat hook along a respective second elongated member, each said cam means returning to its original position when said overhead door is closed.

4,277,096

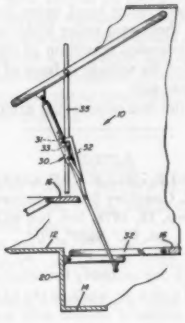
TELESCOPING REACH ROD FOR GATE AND RAMP DEVICE WITH LIFT DECK

Mack A. Lewis, Sioux City, Iowa, assignor to Wilson Trailer Company, Sioux City, Iowa

Filed Oct. 1, 1979, Ser. No. 81,024

Int. Cl.³ B62D *33/04*

U.S. Cl. 296—24 C **8 Claims**



1. In a compartment for retaining livestock, said compartment having sidewalls, a base floor and an upper platform disposed between said sidewalls within said compartment: a ramp hingedly connected to said platform, a lower gate, a hinge means connected to said base floor, one end of said lower gate being connected to said hinge means, an upper gate, a

hinge arrangement connecting said upper gate to said sidewalls, and a telescoping rod hingedly connected between said upper and lower gates and including first and second operably associated members, said first member being slidably received into a hollow interior portion of said second member, said telescoping rod including adjustment means connected thereto for causing a change in an effective length of said rod between an extended position and a retracted position, said effective length corresponding to a slidable movement of said first and second members relative to one another.

4,277,097

VEHICLE HAVING A REAR DECK FOR COVERING A LUGGAGE BOOT

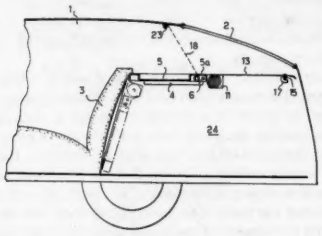
Andre P. Lalanne, Le Mesnil St-Denis, France, assignor to Societe Anonyme Automobiles Citroen and Societe dite: Automobile Peugeot, both of Paris, France

Filed Jul. 19, 1979, Ser. No. 59,052

Claims priority, application France, Jul. 21, 1978, 78 22533

Int. Cl.³ B60R *5/04*

U.S. Cl. 296—37.16 **8 Claims**



1. In a vehicle, the combination which comprises:

a body having a roof, a rear window, and a luggage boot;

a rear seat having an upper part and a back;

a rigid shelf removably fixed to the body in the immediate vicinity of the upper part of the back of the rear seat to extend rearwardly over part of the boot, the length of the shelf in the longitudinal direction of the vehicle being less than that of the luggage boot;

a flexible roller curtain with automatic return positioned to be spread behind said shelf to cover the remaining part of the boot and to define with the shelf a rear deck;

at least one roller blind in the form of a sun blind with automatic return, said roller blind being carried by the rear portion of the shelf, said roller blind having a free edge which, in the extended condition of the blind, is located under the roof of the vehicle in front of the upper edge of the rear window; and

means for fixing the free edge in the extended condition.

4,277,098

FOLDABLE TRUCK CAP ASSEMBLY

Lloyd Gibney, 14 E. Cemetery St., Funkstown, Md. 21734

Filed Sep. 18, 1978, Ser. No. 943,091

Int. Cl.³ B60P *7/04*

U.S. Cl. 296—100 **15 Claims**

1. A foldable truck cap assembly for selectively enclosing an open bed portion of a pick-up truck or the like and comprising:

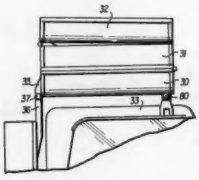
first and second similarly shaped side window assemblies ach mounted on a separate, longitudinally extending truck panel forming opposite sides of said open truck bed;

fastening means for detachably connecting each of said first and second window assemblies to a respective opposite side panel;

a plurality of at least three separate, substantially rigid cap section assemblies each extending between said first and second side window assemblies and positioned adjacent to one another for selectively enclosing said open truck bed;

hinge assembly means extending between and engaging confronting surface portions of said adjacently disposed, substantially rigid cap sections for pivotally joining said substantially rigid cap sections to one another, whereby said pivotally attached substantially rigid cap sections are selectively foldable into a stacked configuration to uncover said open truck bed; and,

said hinge assembly means comprising a first hinge assembly connecting an interior side portion of a first substantially rigid cap section nearest said truck cab with an interior



side portion of an adjacently disposed substantially rigid cap section, and

said hinge assembly means further comprising a second hinge assembly connecting an exterior central wall portion of said adjacent substantially rigid cap section with an exterior central wall portion of a further substantially rigid cap section,

whereby said interior hinge assembly allows said cap sections attached thereto to pivot substantially away from said truck bed and said exterior hinge assembly allows said cap sections attached thereto to pivot substantially toward said truck bed, forming said stacked configuration.

4,277,099

MOTOR VEHICLE WITH AT LEAST ONE DOOR

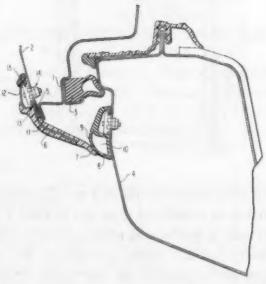
Wilhelm Klein, Aidlingen; Max Bausch, Sindelfingen, and Dieter Eckert, Magstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 19, 1979, Ser. No. 4,880

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802140

Int. Cl.³ B60J *5/04*

U.S. Cl. 296—146 **5 Claims**



1. A motor vehicle body construction comprising:

passenger door means arranged on at least one side of a vehicle body;

side rail means forming an outer wall of the vehicle body and having a surface facing said door means in a closed position of said door means, said side rail means extending

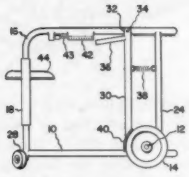
from underneath to above a lower edge of said door means; and

sealing means for preventing soiling of an upper area of said side rail means, said sealing means comprising a first resilient seal means on a lowermost portion of said door means and a second resilient seal means on said surface of the side rails means, said first and second seal means being mutually engaged in said closed position of the door means, wherein said second seal means is provided with cavity means for rendering an outer wall of the second seal means resiliently, inwardly displaceable, said first seal means being positioned relative to said second seal means so as to cause the first seal means to urge said outer wall inwardly in said closed position of the door means whereby seal means freezing problems are minimized.

4,277,100
AMBULATORY APPARATUS

Gael Beougher, Grinnell, Kans. 67738

Filed Oct. 18, 1979, Ser. No. 85,853
Int. Cl.³ A61H *3/04*
U.S. Cl. 297—5 **4 Claims**

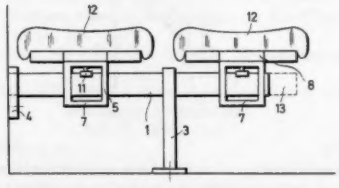


1. A walker for assisting an invalid which comprises a rigid frame, at least three wheels carrying said frame, a brake comprising a shoe dimensioned for engagement with the periphery of one of said wheels, said shoe cooperating with at least said one of said wheels, biasing means for urging said shoe into engagement with said one of said wheels to limit rotation of said one wheel, means for locking said shoe away from said one wheel and against said biasing means so that said shoe does not limit rotation of said one wheel, said means for locking comprising an elongated handle pivotally mounted on said frame and having a generally transverse bore, said means further including a bracket carried on said frame and a pin engaging said bracket and said generally transverse bore when said handle is moved against said biasing means to prevent limitation of rotation of said wheel.

4,277,101
VEHICLE SEAT SUPPORT

Ignaz Vogel, Kleinsteinbacher Str. 44, Karlsruhe, Fed. Rep. of Germany (7500)

Filed Jan. 17, 1980, Ser. No. 112,834
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 2902389
Int. Cl.³ A47C *15/00*
U.S. Cl. 297—232 **5 Claims**



1. A vehicle seat support comprising; a stiff support tube so supported in a vehicle body that it extends in the vehicle body below a row of seats so as to provide support for said seats, said support tube being trapezoidal in cross-section and so arranged that the wider of its two parallel sides is disposed on top facing the seats to be supported; a seat structure including a support shackle mounted on said support tube and having a seat mounted thereon, said seat support shackle having a trapezoidal opening corresponding, in cross-section, essentially to, and receiving, said support tube but being of greater height such that gaps remain between the parallel sides of the support tube and the adjacent support shackle sections; and a thumbscrew mounted in said seat structure above, and extending toward, said support tube for forcing said seat support shackle into firm engagement with said support tube.

4,277,102
CHAIR

Arne Aaras, Lorenskog; Kjell M. Martinsen, Oslo, and Rikard Nakland, Hovik, all of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 17, 1979, Ser. No. 39,758
Claims priority, application Norway, May 24, 1978, 781801
Int. Cl.³ A47C *7/54*
U.S. Cl. 297—411 **8 Claims**

1. A chair having a body and at least one arm rest secured to the chair body, structure for supporting said arm rest and for rendering said arm rest adjustable in all directions, the improvement comprising a first universal joint affixed to the arm rest to render said arm rest rotatable about and tiltable relative to a pivot axis of said joint, an axially elongate support member mating with said joint to support the arm rest and to render the arm rest rotatable about the axis of said support member, a second universal joint affixed to the body of the chair and mating with said support member, the support member being axially advanceable and retractable in said second joint to raise and lower the arm rest accordingly, and means in said second joint allowing lever and rotational movement of said support member in said second joint to render said arm rest movable in a plurality of other motions.

4,277,103
AIRCRAFT SEAT WITH PELVIC PAD

Kirby B. Weik, Litchfield, Conn., assignor to Koehler-Dayton, Inc., New Britain, Conn.

Filed May 25, 1979, Ser. No. 42,329
Int. Cl.³ A47C *7/16, 7/22, 7/02*
U.S. Cl. 297—457 **1 Claim**

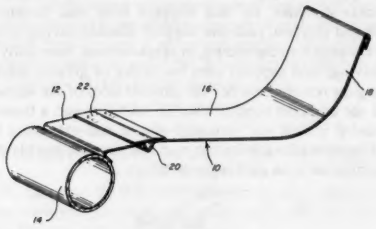
1. A vehicular seat comprising a sheet of aluminum or the like including,

a first horizontally extending substantially planar portion at the front of the seat,

a second portion rearwardly declining at a selected angle relative to said first portion defining the rear portion of said seat, and

a "V" shaped channel joining said first and second portions, and

a strip of aluminum, having a width selected to be wider than the opening of said "V" shaped channel, and secured to said first and second portions along either side of said



channel for maintaining said selected angle between said first and second portions and for defining with said sheet a tubular element to maintain said first portion substantially planar.

4,277,104

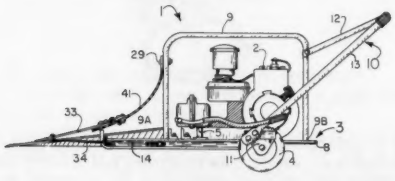
RECIPROCATING SHINGLE REMOVER WITH UPWARD THRUST BLADE

Edward J. Sanchez, 727 Richland Ave., Baton Rouge, La. 70806

Continuation-in-part of Ser. No. 953,411, Oct. 23, 1978. This application Jan. 10, 1980, Ser. No. 111,054

Int. Cl.³ E04D *15/00*

U.S. Cl. 299—37 **2 Claims**



1. A roof shingle remover comprising:

(a) a power source mounted on a frame, said power source attached to one end of a drive means to impart a reciprocal motion thereto, said drive means connected at its other end to a shingle remover plate,

(b) parallel guide plates attached to said frame and extending on opposite sides of said shingle remover plate, said guide plates having aligned slots, and

(c) a plate pushing rod extending through said slots and attached to said shingle remover plate, said slots being positioned in said guide plates and having a sufficiently arched forward end portion to impart an upward thrust by said shingle remover plate during its forward motion.

4,277,105

CONVEYOR SYSTEM FOR A CONTINUOUS MINING MACHINE

John C. Taylor, 128 Fairway Dr., LaFollette, Tenn. 37766

Filed Aug. 7, 1979, Ser. No. 64,565

Int. Cl.³ E21B *35/70*

U.S. Cl. 299—64 **5 Claims**

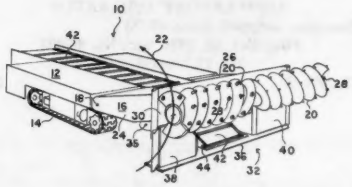
1. A single continuous conveyor for use with a continuous narrow seam mining machine having a dozer type gathering head, a rotating helical or auger mining head and for conveying materials from the front of said mining machine to the rear comprising:

driving means;

a pair of drive sprockets mounted at the rearward portion of said mining machine, said drive sprockets being driven by said driving means;

two continuous parallel drive chains, each of said drive chains extending from a small diameter turn around shaft at the front of the mining machine to and around said drive sprockets at the rear of the mining machine thereby forming a top portion and a bottom portion of each of said chains, said drive chains being driven by said drive sprockets such that said top portion moves in a rearward direction and said bottom portion moves in a forward direction;

a front small diameter turn around shaft, said turn around shaft having a diameter substantially equal to the length of a link of said drive chain and being located at the front most portion of said dozer gathering head and in close proximity to said rotating auger;



a multiplicity of flight bars, each of said multiplicity extending between and attached at its two ends to said two parallel drive chains; and

a base surface extending the full length of said mining machine and location below said top portion of said parallel drive chains and said attached flight bars thereby forming said single continuous conveyor for transporting mined material dislodged from the face of a mine, said continuous conveyor including a pivot for allowing operation in two planes and having an obtuse angle therebetween such that a first portion of said continuous conveyor transports mined material upward and rearward from the foremost portion of the mining machine to the second portion of said continuous conveyor which extends substantially horizontal and rearward from said first portion for further transporting said material maintained to the rearmost portion of said mining machine.

4,277,106

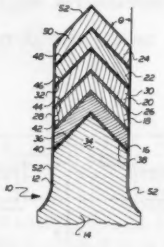
SELF RENEWING WORKING TIP MINING PICK

Lloyd W. Sahley, Mayfield Heights, Ohio, assignor to Syndrill Carbide Diamond Company, Cleveland, Ohio

Filed Oct. 22, 1979, Ser. No. 86,648

Int. Cl.³ E21C *25/38*

U.S. Cl. 299—79 **9 Claims**



1. A pick having a shank and a nose portion extending from the shank and terminating in a conically-shaped lead end working face for the pick, said nose portion having an axis coinciding with the pick axis, said pick being adapted to be mounted

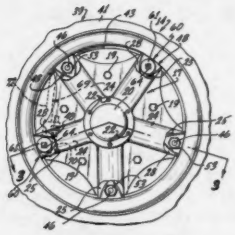
for rotation about said pick axis by a tool holder of a machine for utilizing the pick, said nose portion comprising a series of alternating conically-shaped laminations of hard and softer materials overlying each other proceeding axially of said pick axis, with the layer at the lead end of the pick forming the working face of the pick, said laminations each being concentric about the pick axis and diverging away from the pick axis and the lead end of the pick whereby in use the laminations successively present conically-shaped lead end working faces with the laminations of softer material wearing quickly to expose the next lamination of hard material.

4,277,107

SECURITY BOLTS FOR TRAILER WHEELS

Samuel L. Stone, 6327 La Jara, Lakewood, Calif. 90713

Filed May 29, 1979, Ser. No. 43,444
Int. Cl.³ B60B *23/00*
U.S. Cl. 301—13 SM **7 Claims**



1. Apparatus for preventing unauthorized removal of tires from wheels where the tires are mounted on demountable cylindrical rims which are in turn held in place on the periphery of a wheel hub, said apparatus comprising: a plurality of end clamps angularly spaced about the wheel hub, each said end clamp having a lug portion for wedging against the rim to hold the rim in place on the wheel hub, threaded studs and hexagonal nuts for attaching some of said end clamps on the wheel hub, and security bolts having threaded ends and cylindrical heads for attaching the remaining ones of said end clamps on the wheel hub, each said cylindrical head having a diameter whereby, when the threaded end of the security bolts engages said wheel hub, the side of the cylindrical head substantially contacts the inner cylindrical surface of said rim, and wherein each said cylindrical head has a key opening on the end thereof for receiving a complementary key projection on an adaptor for a wrench by which said security bolt can be rotated.

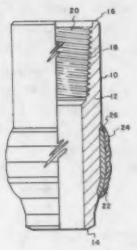
4,277,108

HARD SURFACING FOR OIL WELL TOOLS

Duane W. Wallace, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Division of Ser. No. 7,090, Jan. 29, 1979. This application May 1, 1980, Ser. No. 145,413
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.³ F16C *29/02*
U.S. Cl. 308—4 A **3 Claims**

1. A well tool having surface wear properties enhanced by hard metal banding, said tool comprising a generally cylindrical steel tool body, a first layer of hardbanding material fused to said body, said first layer comprising large particles of sintered tungsten carbide in a mild steel matrix, and a second layer of hardbanding material on top of said first layer, said second



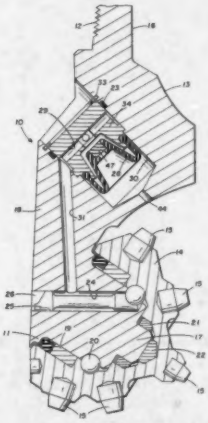
layer comprising sintered tungsten carbide particles in a mild steel matrix.

4,277,109

AXIAL COMPRESSION POSITIVE ROCK BIT SEAL

Morgan L. Crow, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 12, 1979, Ser. No. 75,282
Int. Cl.³ F16C *21/00*
U.S. Cl. 308—8.2 **3 Claims**



1. In an earth boring bit, comprising:
a bit body;
a bearing pin extending from said bit body and defining an annular sealing surface at the juncture of said pin and body comprising a cylindrical portion on said pin and an annular flange portion on said body and an annular transition portion therebetween;
a rolling cone cutter rotatably mounted on said bearing pin and having an annular cone mouth;
an annular seal cavity defined between a portion of said cone mouth and said annular sealing surface of said bearing pin; and
an improved seal assembly sealingly disposed in said seal cavity, said improved seal assembly including:
a first annular rigid ring defining a sealing face for sealingly engaging said flange portion;
an elastomeric ring attached to said annular metal ring and extending radially from both sides thereof with at least the portion extending on the radially inner side also extending axially beyond said sealing face to define a portion that sealingly contacts said transition portion, and;

a second rigid ring attached to the elastomeric ring generally opposite said first ring and defining at least a radially inner axially extending annular leg subadjacent the lip portion and having a greater diameter than said bearing pin to provide annular clearance therebetween and wherein,

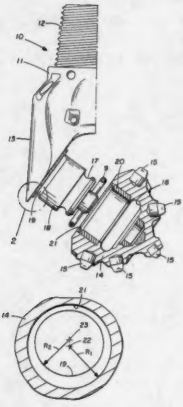
the outer circumferential face of said elastomeric ring is axially coextensive with said leg portion and has an outer diameter larger than said cone mouth whereby the frictional engagement between said cone and said seal assembly is greater than the sealing friction between said lip portion and said pin so that said seal assembly rotates with said cutter on said pin.

4,277,110

EARTH BORING BIT WITH ECCENTRIC SEAL GROOVE

Lenwood Fox, Grand Prarie, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 24, 1979, Ser. No. 78,357
Int. Cl.³ F16C *33/72*
U.S. Cl. 308—8.2 **2 Claims**



1. A rolling cutter earth boring bit, comprising:

a bit body;

at least one bearing pin extending from said bit body, said bearing pin having a central axis;

a rolling cone cutter rotatably mounted on said bearing pin with at least some radial clearance therebetween;

a seal groove on said bearing pin having a center offset from said central axis in the direction of the unloaded surface; and

a seal positioned in said seal groove that is substantially evenly squeezed during operation of said bit.

4,277,111

SUPPORT ELEMENT FOR COMPLIANT HYDRODYNAMIC THRUST BEARING

Stanley Gray, Skaneateles, and Hooshang Heshmat, Troy, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,256
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 **11 Claims**

1. A compliant hydrodynamic fluid film thrust bearing comprising:

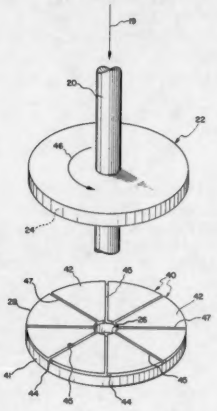
a thrust plate and a relatively rotatable thrust runner, defining therebetween a gap;

a resilient support element positioned in said gap and connected to said plate, said element having a series of raised compliant resilient projections;

a flexible bearing sheet connected to and overlying said support element and being supported thereby;

said support element having an inner circumferential edge and an outer circumferential edge;

said support element having a radial inner zone adjacent said



inner circumferential edge, and two radial outer zones which are radially outboard of said inner zone;

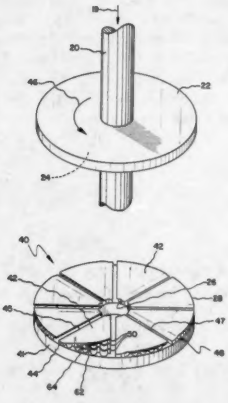
said outer zones both having portions which are compliant independently of each other and said inner zone, and at least one of said outer zones having a compliance different from that of said inner zone.

4,277,112

STEPPED, SPLIT, CANTILEVERED COMPLIANT BEARING SUPPORT

Hooshang Heshmat, Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,503
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 **33 Claims**



1. A compliant hydrodynamic bearing for dynamically supporting a rotating rotor on a mount, including a plurality of pad assemblies positioned between the rotor and the mount, each said pad comprising:

a flexible sheet metal bearing sheet having a bearing surface

in bearing relationship to said rotor and operatively attached to the mount along the bearing sheet leading edge, in the sense of the direction of rotation of the rotor;

a compliant support element, operatively fixed to the mount, lying between said bearing sheet and the mount, and having resilient elevations projecting therefrom compliantly supporting said bearing sheet;

a first flat stiffener sheet having a leading edge and a trailing edge, said first stiffener sheet lying upon said support element with said trailing edge thereof aligned with said trailing edge of said bearing sheet, and extending toward said bearing sheet leading edge; and

a second flat stiffener sheet having a leading edge and a trailing edge, said second stiffener sheet lying between said first stiffener sheet and said bearing sheet and extending forwardly toward said bearing sheet leading edge, substantially beyond said first stiffener sheet, but short of the forward edge of said support element.

15. A compliant hydrodynamic fluid film bearing including a fixed member; a rotating member; said members defining therebetween a gap; a plurality of bearing pads in said gap attached to said fixed member and in bearing relation to said rotating member; said pads each having a bearing sheet facing said rotating member and a resilient, compliant support element underlying and supporting said bearing sheet and fastened to said fixed member; wherein the improvement comprises:

means establishing a gradient of decreasing stiffness of each of said bearing pads from the trailing edge thereof toward the leading edge in the direction of rotation of the rotating member, said pads each having a compliant zone adjacent the leading edge and terminating in a stiff zone;

wherein the stiffness pattern over the area of the bearing pad militates for an optimal deflection pattern of said bearing sheet, viz. large deflection adjacent the leading edge and decreasing deflection toward the trailing edge of said pad to provide a tapering wedge at the leading edge and strong support at the trailing edge, to produce a maximal load bearing capacity hydrodynamic fluid film over the bearing sheet throughout the full speed range of the bearing.

25. A compliant hydrodynamic fluid film bearing comprising:

a mount and a relatively rotating rotor, defining therebetween a gap;

a plurality of bearing pads in said gap, affixed to said mount, each having a leading edge and a trailing edge in the sense of the direction of rotation of said rotor;

each said pad including a bearing sheet having a bearing surface in bearing relationship to said rotor, a resilient support element attached to said mount and underlying and providing compliant support for said bearing sheet, and stiffening means lying between said bearing sheet and said support element for increasing the stiffness of portions of the support for said bearing sheet;

said stiffening means including a stiffener element extending from said trailing edge toward said leading edge, terminating short of said leading edge;

said stiffener element being formed of a plurality of strips running generally parallel to each other and to the direction of motion of said rotor.

4,277,113
COMPOSITE MATERIAL COMPLIANT BEARING ELEMENT

Hooshang Heshmat, Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,504
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 **21 Claims**

1. A compliant fluid film bearing for dynamically supporting a rotating rotor, comprising:

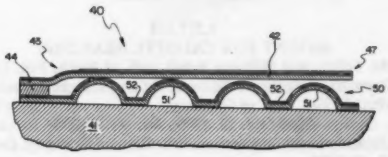
a mounting member mounted in coaxial relationship to the rotational axis of said rotor and having a surface facing a bearing surface of said rotor;

a compliant support element fastened to said surface of said mounting member, said compliant support element including a metal support sheet having a plurality of resilient support elevations projecting therefrom;

a bearing sheet lying between said support element and the bearing surface of said rotor;

said support element formed of a composite material having a first layer of metal in engagement with said mounting member, and an overlying layer of metal in engagement with said bearing sheet and bonded to said first layer, said overlying layer having a coefficient of thermal expansion greater than the coefficient of thermal expansion of said first layer;

whereby a decrease in the stiffness of the material of the support element with increasing temperature is compensated for by an increase in stiffness of said elevations by



virtue of the difference in coefficients of thermal expansion of the materials of the first and overlying layers.

17. A compliant fluid film bearing for dynamically supporting a rotating rotor on a mounting member, comprising:

a flexible bearing sheet having a bearing surface facing and supporting said rotor;

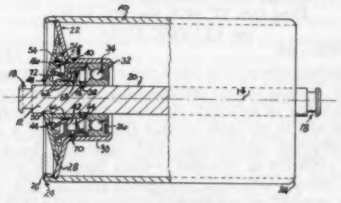
a resilient compliant support element between said bearing sheet and said mounting member for compliantly supporting said bearing sheet;

said flexible bearing sheet being formed of a composite material including a base sheet of strong springy metal and a second metal diffused into said first metal and distributed therein in a concentration decreasing exponentially with the depth below one surface of said base sheet, said second metal having a yield strength less than the yield strength of said strong springy metal, whereby the damping and high temperature load bearing capacity of said bearing is enhanced.

4,277,114
ROLLERS INCLUDING LABYRINTH SEALS

Eric X. Lindegger, P.O. Box 835, Germiston, 1400, South Africa

Filed Sep. 18, 1979, Ser. No. 76,537
Claims priority, application South Africa, Sep. 26, 1978, 78/5451
Int. Cl.³ F16C *13/02, 33/80*
U.S. Cl. 308—20 **16 Claims**



1. A roller for a conveyor, the roller comprising:

a roller shaft;

a tubular shell;

a plurality of bearing means, each including a bearing hous-

ing having a mounting wall secured to said shell and a housing portion receiving a respective bearing, said tubular shell being rotatably mounted on said roller shaft by said plurality of bearing means; and labyrinth seals associated with said plurality of bearing means for inhibiting ingress of dirt and moisture to said bearings, wherein each labyrinth seal comprises a slinger rotatable with the shell and having annular slinger walls extending away from each associated bearing and diverging away from said shaft and a labyrinth shield mounted on said shaft and having annular shield walls interleaved with said slinger walls, said labyrinth shields each having a tubular portion fitting firmly on said shaft and a radially outwardly extending wall extending away from said shaft and having an outer edge terminating close to said mounting wall of each associated bearing means, said shield walls diverging away from said shaft as they extend in a direction towards said mounting wall from said radially outwardly extending wall.

4,277,115

MOUNT FOR CALOTTE BEARINGS

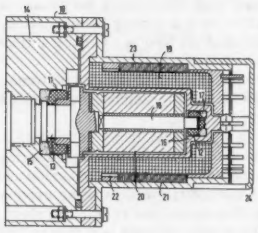
Botho Stüwe, and Wilhelm Vobel, both of Fürth, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 86,956

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1978, 2847009

Int. Cl.³ F16C *27/06*

U.S. Cl. 308—26 **8 Claims**



1. An improved mount for calotte bearings which are disposed opposite a bearing support element comprising:

(a) a ring of an elastomer or of felt disposed between the calotte bearing and the bearing support element; and

(b) grooves in the support element and the calotte bearing in the region of said ring.

4,277,116

BEARING CONSTRUCTION AND RETAINER THEREFOR

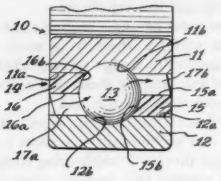
Jerre F. Lauterbach, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Oct. 17, 1979, Ser. No. 85,803

Int. Cl.³ F16C *33/38*

U.S. Cl. 308—188 **12 Claims**

1. A bearing comprising inner and outer races arranged in concentric radially spaced relation with respect to a common axis; a plurality of spherical elements disposed intermediate said races and in movable contact therewith; and a unitary retainer disposed intermediate said races and having said spherical elements in movable contact therewith and being separated thereby into annularly spaced relation, said retainer including first and second ringlike sections arranged in axially spaced concentric relation, said first section having an inner annular peripheral surface and said second section having an outer annular peripheral surface, the diameter of said first section inner surface being at least as great as the diameter of said second section outer surface, said first and second sections being interconnected by a plurality of struts arranged in annularly spaced relation, each strut being disposed between a pair of spherical elements, the segments of each ringlike section disposed intermediate said struts having contoured surfaces in



substantial contact with said spherical elements, the contour of said contacting surfaces corresponding substantially to but slightly greater than the curvature of the exterior surface of said spherical elements.

4,277,117

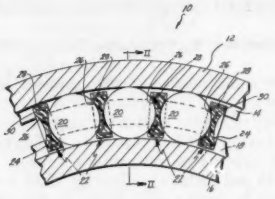
INTERNALLY REINFORCED BALL BEARING SPACER

Richard F. George, Muskegon, Mich., assignor to Keene Corporation, New York, N.Y.

Filed Aug. 15, 1979, Ser. No. 66,646

Int. Cl.³ F16C *33/38*

U.S. Cl. 308—199 **11 Claims**



1. A spacer for interposition between adjacent balls in a ball bearing assembly having a plurality of spherical balls comprising:

a thermoplastically molded body formed from a resiliently deformable thermoplastic material, said body having a cylindrical periphery and oppositely disposed ball-engaging sides;

an internal reinforcement disc formed from sheet metal stock, said reinforcement disc being embedded and centered in said thermoplastically molded body;

a generally flat central portion roughly centered on said disc;

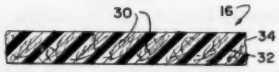
a circumferential flange formed on said reinforcement disc, said circumferential flange being disposed about the periphery of said generally flat central portion of said disc, said circumferential flange being embedded in said body and extending beneath said cylindrical periphery of said body;

whereby said body cools more rapidly than said reinforcement disc after the thermoplastic molding of said body and said reinforcement disc thereby provides a compressive prestress on said body.

4,277,118
BEARINGS WITH FELTED TEFLON LINERS

Albert R. McCloskey, Fairfield, Conn., assignor to Incom International Inc., Pittsburgh, Pa.

Filed May 15, 1978, Ser. No. 905,854
Int. Cl.[3] F16C *27/00*
U.S. Cl. 308—238 92 Claims



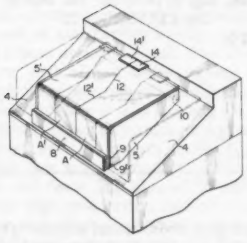
1. A sheet of material comprising

a sheet of felted fibers in combination with resin having no surface bonding to the felted fibers, wherein the intertangled relationship of the felted fibers within the resin mechanically entraps the felted fibers in the resin, said felted fibers comprising polytetrafluoroethylene fibers and said fibers and said resin being formed of dissimilar material.

4,277,119
COVER FOR COUNTING ZONE IN NOTE COUNTER

Shinya Uchida, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1978, Ser. No. 931,903
Claims priority, application Japan, Aug. 8, 1977, 52-105995[U]
Int. Cl.[3] A47B *63/00;* B42F *17/00*
U.S. Cl. 312—208 4 Claims

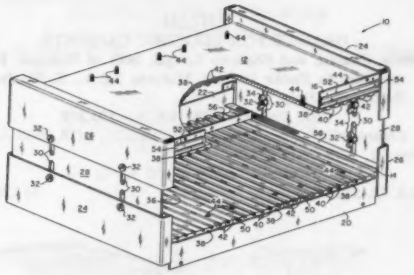


1. In a note counter wherein the number of a bundle of notes packed in a holder is counted, the combination of a frame provided with an open counting zone, a cover for covering the open counting zone, said cover comprising two transparent cover members disposed side by side and each having a front portion and a rear portion, front guide means for guiding each of front portions of said cover members into position, rear guide means for guiding each of rear portions of said cover members into position, and motor drive means for driving said two transparent cover members to move in respective opposite directions, whereby to alternately separate them from each other and join them together, wherein said opening counting zone has a front edge and a rear edge, and said front guide means comprises two vertically disposed grooves laterally extending along the front edge of said open counting zone, said rear guide means comprising one groove laterally extending along the rear edge of said open counting zone, each of said cover members being provided with a slider at the front portion thereof to slidably move in either one or two vertically disposed grooves and a roller at the rear portion thereof to rotatably move in said one groove laterally extending along the rear edge of said open counting zone.

4,277,120
PRINTED CIRCUIT BOARD STORAGE CABINET

Leo O. Drake, Ridge La., Mill Neck, N.Y. 11765, and Randall S. Drake, 85A Old Oak La., Levittown, N.Y. 11756

Filed May 29, 1979, Ser. No. 42,867
Int. Cl.[3] H02B *1/02;* H05K *7/14;* A47B *88/00*
U.S. Cl. 312—320 2 Claims



1. A retaining and storage device for printed circuit boards comprising:

a pair of substantially parallel and opposingly spaced surfaced support members for accommodating a plurality of printed circuit boards substantially normally therebetween,

a pair of sidewalls substantially perpendicularly depending from and connecting opposite ends of said support members so as to define an enclosure bounded by said opposed support members and said connecting sidewalls and having a frontal opening for enabling insertion of printed circuit boards into said enclosure,

printed circuit board retaining means for detachable securement on each of said support members in the interior of said enclosure and comprising plural retaining plates, each of said plates being substantially flat and planar and including a plurality of parallel grooves of a predetermined width defined therein and extending uninterruptedly between opposite edges of said plate for supportedly receiving in said grooves edges of printed circuit boards which substantially conform in thickness to the predetermined width of said grooves, and means on each said plate for interlocking adjacently disposed ones of said plates so as to form a substantially continuous and unbroken planar surface of a plurality of said adjacently disposed plates as though the same were unitarily formed, the plurality of grooves of one of said plates being capable of being of a predetermined width different from that of the grooves of others of said plates,

and means for detachable engagement of said plural plates on said opposed surfaces of said support members to strengthen and rigidify the same and so that said grooves extend from said frontal opening into the interior of said enclosure for receiving and guiding printed circuit boards inserted into said device through the frontal opening and for supporting the printed circuit boards in said grooves substantially parallel to said sidewalls and perpendicularly between said opposed support members,

the provision of said plural interlocked retaining plates engaged by said detachable engaging means in planar surface to surface engagement with said surface of each of said support members connects and joins said planar surfaces together into an integral unitary surface by which said planar surfaces add to said surfaces of such support members to reinforce and rigidify the same,

said detachable engagement means comprises plug means integral with and projecting out of the plane of said plates for receipt in openings correspondingly defined in said support member surfaces and include radially flexible resilient elongated fingers each having a normal diameter

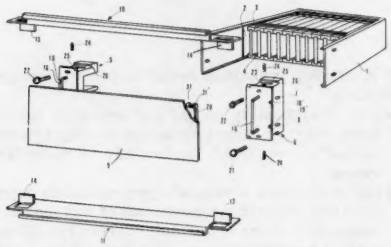
along at least a portion of its length larger than the diameter of said support member openings, each of said fingers being radially inwardly contractable during insertion of the finger into the corresponding support member opening and radially outwardly expandable to return the same to its normal diameter following said insertion into the corresponding opening.

4,277,121

DRAWER FOR ELECTRIC CABINETS

Mario Possati, and Giuliano Longhi, both of Bologna, Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Dec. 13, 1979, Ser. No. 103,359
Claims priority, application Italy, Dec. 21, 1978, 3628 A/78; Dec. 21, 1978, 3629 A/78
Int. Cl.³ A47B *88/00, 95/02*
U.S. Cl. 312—320 **14 Claims**



1. Drawer for electric cabinets comprising a frame with a rectangular front opening, the frame defining stationary surfaces adapted to permit pivotal movements; a rectangular removable panel for closing said front opening; a locking device for rigidly locking the panel to the frame and for permitting removal of the panel, the locking device including a mobile horizontal cross-member, the cross-member defining a first portion, channel shaped, adapted to grip a corresponding edge of the panel, a second portion having a side adapted to be coupled with said stationary surfaces, and reference surfaces, the second portion defining an arm for controlling substantially vertical movements of the first portion with respect to the panel; control means, which cooperate with the mobile cross-member and with the frame, for coupling said stationary surfaces and said side of the second portion and for permitting substantially pivotal movements of the cross-member, the control means including mobile elements which cooperate with the reference surfaces for controlling said substantially pivotal movements of the cross-member for bringing the grip surfaces in contact with the panel and for moving the grip surfaces away from the panel for permitting a frontal removal of the panel.

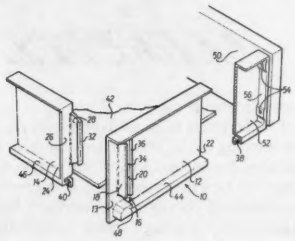
4,277,122

CORNER FITTINGS

Stefan Bargiel, Liverpool, England, assignor to Newage Kitchens Limited, Liverpool, England

Filed Oct. 11, 1979, Ser. No. 83,611
Int. Cl.³ A47B *88/00*
U.S. Cl. 312—330 R **10 Claims**

1. A kit of parts for making up a drawer comprising a bottom wall, side walls, a front wall and a rear wall, the two side walls and the rear wall on their inner aspects being formed with a groove such that with the side walls joined to the rear wall, the bottom wall can be positioned in place by being slid in the grooves of the side walls until the rear edge of the bottom wall is received in the groove of the rear wall, said drawer walls being held rigidly together by cooperating means integrally formed as end portions of the rear wall as rear end portions of the side walls, and separately formed fastening means securing the front ends of the side walls to the front wall; said integrally formed cooperating means comprising in respect of each side wall rear end portion and respective rear wall end portion, a barb-like member on one of them and an elongated throughgoing opening on the other of them passing transversely thereof and with, on the exterior side of the other wall portion, an upstanding member partially bounding said opening so that



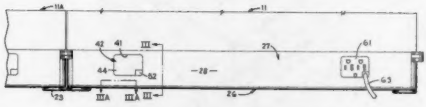
when the barb is inserted through the elongate opening from the interior side of the other wall portion, the upstanding member acts as a shoulder over which the barb-like member can be engaged in a snap-fitting manner; and on the exterior of the other wall portion, means for biassing the barb-like member and the upstanding member when engaged against one another to maintain them in engagement.

4,277,123

RACEWAY STRUCTURE FOR POWER PANEL

Richard G. Haworth, Holland; Harold R. Wilson, Holland Township, Ottawa County, and Ditmar K. Tillmann, Holland, all of Mich., assignors to Haworth Mfg., Inc., Holland, Mich.

Filed Aug. 8, 1979, Ser. No. 64,931
Int. Cl.³ H02G *3/22*
U.S. Cl. 339—22 R **19 Claims**



1. In an upright space divider panel adapted to be series-connected with similar such panels for forming a space-dividing wall, said panel having raceway means mounted thereon and extending longitudinally along the lower edge thereof for defining therein a longitudinally extending channel, said raceway means being defined by a pair of spaced and substantially parallel side covers disposed adjacent and approximately coextensive with the opposite side surfaces of the panel, at least one of said covers being movable relative to the panel to provide access to said channel from the side thereof, comprising the improvement wherein one of said side covers has a windowlike opening formed therein and extending therethrough for providing access into and out of said channel, a closure for closing said opening, said closure being positionable within and substantially totally occupying said opening and being substantially flush with said side cover when in the closed position, connecting means for permanently connecting said closure to said side cover while permitting movement of said closure into a storage position within the interior of said channel so as to uncover said opening, an end cover disposed adjacent one edge of said panel and extending transversely across the end of said channel for closing same, said end cover having an opening formed therein and extending therethrough for providing access into the adjacent end of said channel, a barrier for closing said last-mentioned opening, and means joining said

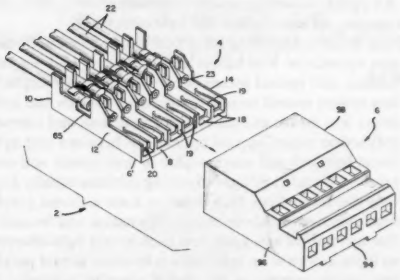
barrier to said end cover for permanently connecting said barrier to said end cover while enabling said barrier to be movably displaced from a location within said last-mentioned opening for closing same into a storage position disposed within said channel for uncovering said last-mentioned opening.

4,277,124

CONNECTOR HAVING WIRE-IN-SLOT CONNECTING MEANS AND CRIMPED STRAIN RELIEF

Winfield W. Loose, Linglestown, and Alan R. MacDougall, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 1, 1979, Ser. No. 80,850
Int. Cl.³ H01R *4/24*
U.S. Cl. 339—99 R **7 Claims**



1. A preloaded multi-contact electrical connector of the type comprising an insulating housing having a mating face, a wire entry face, oppositely directed endwalls, and oppositely directed sides extending between said faces, a plurality of side-by-side cavities extending through said housing and between said faces, each of said cavities having opposed cavity sidewalls which extend normally of said sides of said housing and having a floor, each of said cavities having a wire-admitting portion which opens onto one of said sides and which extends from said wire entry face at least partially towards said mating face, an electrical contact terminal in each of said cavities, each of said terminals having a contact portion which is proximate to said mating face and a wire-rereceiving portion which is intermediate said faces and adjacent to said wire-admitting portion of its respective cavity, said wire-receiving portion having a free end which is adjacent to said one side of said housing and having wire-receiving slot means extending inwardly from said free end, said slot means having inner end portions dimensioned to penetrate the insulation of said wire and establish electrical contact with the conducting core thereof upon movement of said wire laterally of its axis and into said slot means, said connector being characterized in that:

each of said terminals, has a crimpable strain relief portion integral therewith proximate to said wire entry face, said strain relief portion having a web and terminal sidewall means extending from said web towards said one side of said housing, said terminal sidewall means having tool engageable free end portions which are spaced from said cavity sidewalls of the cavity in which said terminal is disposed thereby to permit engagement with a crimping tool and bending of said terminal sidewall means towards said web,

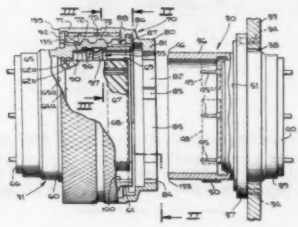
said cavity sidewalls having notches therein, said free end portions of said terminal sidewall means being received in said notches whereby, upon placement of a plurality of wires in side-by-side relationship and in alignment with said terminals, and upon movement of said wires of their axes and into said wire-receiving portions of said terminals, said wires will be located on said webs, and upon bending of said sidewall means towards said webs and against said wires, said crimpable portions will be crimped onto said wires and said wires will extend from said wire entry face of said housing.

4,277,125

ENHANCED DETENT GUIDE TRACK WITH DOG-LEG

David J. Ball, Pacific Palisades, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Jul. 12, 1979, Ser. No. 57,134
Int. Cl.³ H01R *13/639*
U.S. Cl. 339—113 R **8 Claims**



1. In an electrical connector having receptacle means including a receptacle shell; a plug means including a plug housing; a coupling nut threaded onto said plug housing; a coupling ring keyed to said coupling nut; electrical contact elements carried within said receptacle shell and said plug housing for electrical mating and unmating; lock means on said coupling ring and said receptacle shell for releasably holding said contact elements in mating relation; means for audibly indicating fully mated and locked relationship of said receptacle means and plug means, said indicating means including an annular groove in said coupling ring, a keyway on said plug housing, and an arcuate spring detent in said annular groove and having a key engaged in said keyway, said detent having radially outwardly directed end portions carried by resilient arcuate arms which are bent when the end portions thereof are between spaced sets of radially outwardly directed recesses in said annular groove during turning of said coupling housing, whereby said end portions snap into a set of recesses to produce an audible sound to indicate fully locked or unlocked position of the receptacle means and plug means, the improvement comprising: an enlarged portion defining a dog-leg in said keyway in the path of axial travel of said plug housing whereby said key makes audible contact with a terminating wall of said dog-leg so as to produce an intensified audible snap indicating attainment of the fully mated and locked position of the connector.

4,277,126

RELEASABLE KEY ARRANGEMENT FOR AN ELECTRICAL CONNECTOR

Thomas C. Lincoln, South Pasadena, Calif., assignor to Malco, South Pasadena, Calif.

Continuation-in-part of Ser. No. 5,907, Jan. 23, 1979, abandoned. This application Sep. 13, 1979, Ser. No. 75,219
Int. Cl.³ H01R *13/504*
U.S. Cl. 339—186 M **14 Claims**

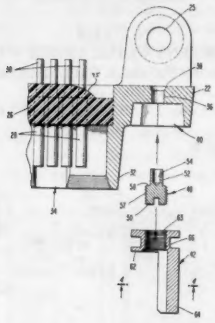
7. A releasable polarizing arrangement for a connector which carries a support member, said polarizing arrangement comprising:

a polarizing key adapted for securement to a side of said support member,

a retainer for releasably securing said key to said support member, said retainer including:

securing means for normally positively mounting said retainer to said support member for rotation relative thereto while being constrained against relative axial displacement, and for positively connecting said re-

tainer to said key in response to rotation of said retainer to secure said key to said support member,



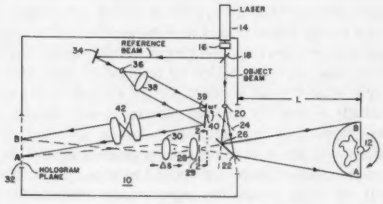
said retainer including means accessible from said side of said support member for rotating said retainer.

4,277,127

DOPLER EXTENDED DEPTH OF FIELD IMAGING SYSTEM WITH COHERENT OBJECT ILLUMINATION

James L. Smith, Grand Prairie, Tex., and Charles R. Christensen, Athens, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 3, 1979, Ser. No. 99,262
Int. Cl.³ G03H *1/14*
U.S. Cl. 350—3.67 **2 Claims**



1. A holographic Doppler extended depth of field imaging system having coherent object illumination comprising:

a. a laser disposed for generating a coherent light beam, said laser having shutter means for directing said light beam;

b. a rotating reflecting object to be recorded;

c. a first beam splitter means for splitting said light beam into reference and object beams;

d. a first beam expander for expanding said object beam;

e. a second beam splitter disposed between said rotating reflecting object and said first beam expander for directing said object beam to said rotating reflecting object;

f. a slit aperture lens for receiving the reflected object beam from said rotating reflecting object;

g. a focus lens disposed for receiving said reflected object beam;

h. a hologram plane for receiving said focused object beam;

i. a mirror for reflecting said reference beam;

j. a second beam expander for expanding said reflected reference beam;

k. a collimator for collimating said reference beam;

l. a rotating/oscillating mirror for receiving said collimated reference beam for Doppler encoding thereof; and,

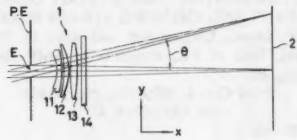
m. a focus lens pair for receiving said collimated reference beam and for directing said reference beam to said hologram plane.

4,277,128

ANAMORPHIC FθLENS SYSTEM

Atsushi Kawamura, Yokosuka, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 15, 1979, Ser. No. 20,711
Claims priority, application Japan, Mar. 23, 1978, 33917
Int. Cl.³ G02B *13/08, 27/17*
U.S. Cl. 350—6.8 **7 Claims**



1. An optical scanning system comprising:

a scanning surface; cylindrical lens means; and

optical means establishing an optical axis that passes through said cylindrical lens means and intercepts said scanning surface, said optical means comprising an anarmorphic fθ lens system spaced on said optical axis between said cylindrical lens means and said scanning surface, and rotatable polyhedric means on said optical axis between said cylindrical lens and said anarmorphic fθ lens system and comprising a plurality of light-diverting surfaces equally angularly displaced from each other to form a closed polyhedron symmetrical about an axis of rotation and located so that said optical axis intercepts each of said light-diverting surfaces in turn at an interception location as said polyhedric means rotates on its axis of rotation, whereby the portion of said optical axis, between said interception location and through and beyond said cylindrical lens remains substantially stationary and the portion of said optical axis between said interception location and said scanning surface sweeps along a line on said scanning surface as a function of the instantaneous angular position of said rotatable polyhedric means, the focusing power of said cylindrical lens means, and the location thereof relative to said interception location being such that a beam of light rays centered on said optical axis and parallel to each other on the side of said cylindrical lens means facing away from said polyhedric means are substantially at a line focus at said interception location, and the focusing power of said anamorphic fθ lens system and location thereof relative to said scanning surface and to said cylindrical means is such that said beam which is substantially at a line focus at said interception location is substantially at a point focus at said scanning surface;

said anamorphic fθ lens system comprising, starting from a side thereof facing said polyhedric means, a negative meniscus lens, a positive meniscus lens spaced from said negative meniscus lens, a biconvex lens spaced from said positive meniscus lens, and a cylindrical lens spaced from said biconvex lens.

4,277,129

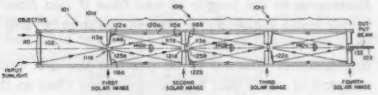
MULTIPLE STAGE OPTICAL SYSTEM FOR CREATING HIGH-INTENSITY SOLAR LIGHT BEAM

Kenneth F. Taucher, 7069 Hoover Dr., Mentor, Ohio 44060

Continuation-in-part of Ser. No. 880,764, Feb. 24, 1978, Pat. No. 4,183,612. This application Nov. 1, 1979, Ser. No. 90,302
Int. Cl.³ G02B *17/00*
U.S. Cl. 350—27 **21 Claims**

1. A multiple stage optical concentrator, comprising: plural optically aligned concentrating stages, each including input means for delivering a plurality of relatively diverging collimated light bundles, and converging means for converging said plurality of diverging collimated light bundles and each of the same to an area of concentration; and

output means for substantially collimating light from said area of concentration at the last of said concentrating



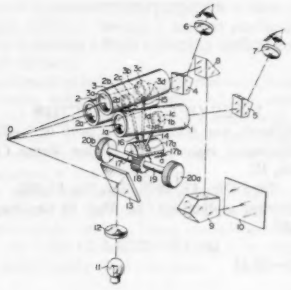
stages to form a relatively concentrated, substantially collimated output beam.

4,277,130

ZOOM STEREOMICROSCOPE WITH TAKING LENS BARREL

Naoyuki Takahashi, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,552
Claims priority, application Japan, Feb. 18, 1978, 53-17131
Int. Cl.³ G02B *21/22*
U.S. Cl. 350—36 **8 Claims**



1. A zoom stereomicroscope with taking lens barrel comprising a pair of binocular observation lens barrels each containing an observation optical subsystem including a zooming optical subsystem, an auxiliary lens barrel supporting another optical subsystem including a zooming optical subsystem which is focused in the same manner as the observation subsystems, each of said zooming optical subsystems including a movable lens, a plurality of drive members each extending through the individual lens barrels and connected with a movable lens of the associated zooming subsystem, and drive means for operating the drive members and moving said movable lenses in unitary fashion.

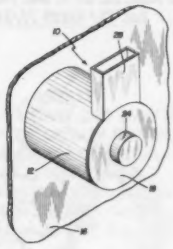
4,277,131

ANTIFOULING WINDOW ASSEMBLY

W. Howard Hart, Largo, Fla., and Helmut E. Weber, Valley Forge, Pa., assignors to The United States of America as represented by the Administrator of the United States Environmental Protection Agency, Washington, D.C.

Filed Jan. 29, 1980, Ser. No. 116,525
Int. Cl.³ G02B *7/00*
U.S. Cl. 350—63 **5 Claims**

1. In a duct gas monitoring system including window means for viewing duct gases through a duct opening, wherein there is a tendency for the window means to become fouled by particulate matter in said gases, an antifouling window assembly comprising a housing having an open end mounted on said duct at the duct opening, said housing having a cross sectional area greater than the cross sectional area of said duct opening and defining a circulation chamber means; inlet means for supplying a purge gas into said housing at a flow velocity to provide substantially laminar gas flow along a surfact of said window means, said housing including a divider plate for dividing said chamber means into a first chamber adjacent said window means and a second chamber adjacent said duct opening, said divider plate containing an an orifice located on a



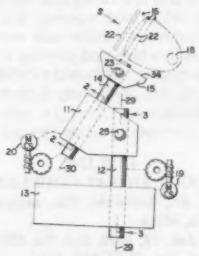
viewing axis, said purge gase circulating successively within said first and second chambers before passing into said duct through the duct opening to mix with the duct gases.

4,277,132

AUTOMATIC BIAXIAL SUN TRACKING MECHANISM FOR SUN RAY UTILIZATION DEVICES

Paul A. Hansen, 435 Dogwood Rd., West Columbia, S.C. 29169

Filed May 2, 1979, Ser. No. 35,425
Int. Cl.³ G02B *7/18*
U.S. Cl. 350—83 **8 Claims**



1. An automatic biaxial sun tracking mechanism for sun ray utilization devices comprising means for continuously orienting said devices relative to the sun, said means including:

A. a shaft-connecting means to provide a fixed angular relationship of the longitudinal axes of a polar shaft and a declination shaft;

B. a polar shaft suitably supported so that its longitudinal axis is oriented parallel to the earth's axis of rotation, and said polar shaft having suitable means to rotate said shaft-connecting means about said longitudinal axis of said polar shaft;

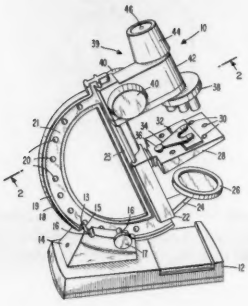
C. a declination shaft rotatably connected to said shaft-connecting means, and having suitable means for rotation about its longitudinal axis, and having connected to it by suitable means a mount structure;

D. a mount structure for supporting and positioning said sun ray utilization devices, and said mount structure having suitable means for rotation about the longitudinal axis of said declination shaft.

4,277,133
MICROSCOPE

Dale O. Staehle, Racine, Wis., assignor to Western Publishing Company, Racine, Wis.

Filed Mar. 22, 1979, Ser. No. 23,058
Int. Cl.[3] G02B 21/24
U.S. Cl. 350—90 11 Claims

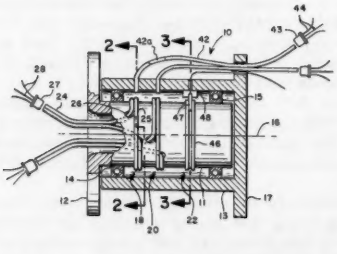


9. A microscope comprising:
a frame member;
a microscope lens assembly mounted on said frame member;
a viewing stage mounted on said frame member and having a viewing zone viewable through said lens assembly and a plurality of hole circumscribing said viewing zone;
a first swing slide member having a viewing area;
a second swing slide member having a viewing area; and
a first peg on said first swing slide member and positioned in one of the holes of said viewing stage and a second peg on said second swing slide member and positioned in another of the holes of said viewing stage for pivotably mounting said first and second swing slide members on said viewing stage for pivoting between a first position in which said viewing area of said first swing slide member is within said viewing zone while said viewing area of said second swing slide member is outside said viewing zone and a second position in which said viewing area of said second swing slide member is within said viewing zone while said viewing area of said first swing slide member is outside said viewing zone.

4,277,134
FIBER OPTIC LOOP SIGNAL COUPLER APPARATUS

Robert W. Upton, Jr., Seminole, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 19, 1978, Ser. No. 870,907
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.20 14 Claims

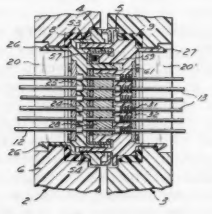


1. Fiber optic rotary coupler apparatus for transmitting light signals between first and second bodies, one of which is rotatable relative to the other about an axis of rotation, comprising:
a first light transmitting fiber of a type through which light is longitudinally transmitted by total internal reflection if said fiber is maintained at a radius no smaller than a predetermined critical radius, and from which light escapes transverse to the length of said fiber if said fiber is bent into a radius within a predetermined range of radii smaller than the critical radius;
a first member adapted to be fixed to the first body, and adapted to carry said light transmitting fiber so that it is maintained in at least one complete circular loop having a radius within the predetermined range, the loop being centered on the axis of rotation and generally lying in a first plane perpendicular thereto;
a first light source fixed relative to the first body and oriented to project a light signal into an end of said first light transmitting fiber;
first light detector means; and
a second member adapted to be fixed to the second body, and adapted to carry at least part of said first light detector means so that it is positioned to receive light signals which escape from said first light transmitting fiber.

4,277,135
FIBER OPTIC CONNECTOR

Werner G. Schrott, and Hans Wodok, both of Heilbronn, Fed. Rep. of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 17, 1979, Ser. No. 85,565
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845420
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.21 9 Claims

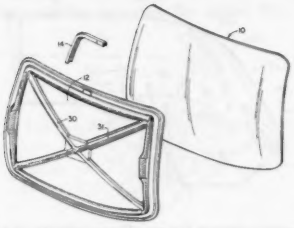


1. A fiber optic connector comprising: an optical fiber holder having an outer first face and a second face parallel to said first face and inwards thereof facing in the same direction as said first face, said holder including means for retaining at least one elongated optical fiber adjacent the end thereof in a fixed position within said holder perpendicular to and adjacent said second face, said holder further including at least one elongated recess in one of said first and second faces, said recess being generally parallel to the longitudinal axis of said optical fiber, said holder further including at least one wedge means projecting from the other of said first and second faces parallel to said recess, said recess and wedge means being adapted to fit a corresponding wedge means and recess, respectively, in a cooperating connector upon mating of said connector and said cooperating connector; and a cover attached to said holder, said cover including closure means slidable upon said first face from a normally closed position covering the end of said optical fiber to an open position exposing the end of said optical fiber, and biasing means maintaining said closure means in a closed position.

4,277,136
REFLECTOR CONSTRUCTION

Conrad R. Schudel, 6973 Consolidated Way, San Diego, Calif. 92121

Continuation of Ser. No. 856,435, Dec. 1, 1977, Pat. No. 4,155,625. This application May 15, 1979, Ser. No. 39,420
The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.
Int. Cl.[3] G03B *21/56*
U.S. Cl. 350—125 14 Claims

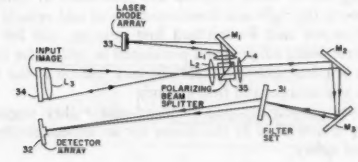


1. A reflector system such as a projection screen comprising:
a semi-rigid reflector having a curved configuration, said reflector including a front reflecting surface and an opposite back surface;
a semi-rigid backing having a peripheral margin substantially co-extensive with the periphery of the reflector, said peripheral margin projecting forwardly with respect to the remainder of the backing, said remainder having a curved configuration generally approximating the curved configuration of the reflector; and
means for attaching the peripheral margin of the backing to the periphery of the back surface of the reflector, the remainder of the backing being spaced from the reflector so that the reflector and the backing in combination provide a substantially rigid structure.

4,277,137
COHERENT OPTICAL CORRELATOR

Juris Upatnieks, Ann Arbor, Mich.; Charles R. Christensen, Athens, and Bobby D. Guenther, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,325
Int. Cl.[3] F41G *7/22;* F42B *15/02*
U.S. Cl. 350—162 SF 2 Claims



1. An optical correlator comprising an array of coherent light sources; an imaging device having an input image thereon; a filter set array having a plurality of filters therein; first means selectively directing one of said light sources through said imaging device so as to form a Fourier transform of the image at a corresponding location in said filter set array; a detector array having a plurality of detectors thereon; said filter set array having stored reference images thereon such that if the input image illuminated by the selected light source corresponds to the reference image, then a correlation spot will appear in a corresponding field of the detector array; said coherent light sources comprises a plurality of laser diodes; and a polarizing beam splitter connected between said laser diodes and said imaging device so as to reflect light from said laser diodes through said imaging devices and to pass reflected light from said imaging device through said beam splitter to said filter set array.

4,277,138
DIFFRACTION GRATING AND SYSTEM FOR THE FORMATION OF COLOR COMPONENTS

Hans Dammann, Tangstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

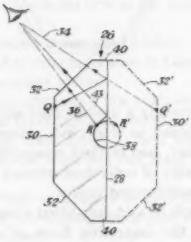
Continuation of Ser. No. 838,632, Oct. 3, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 24,285
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2645075
Int. Cl.[3] G02B *27/44, 25/18*
U.S. Cl. 350—162 R 11 Claims

1. A diffraction grating, for dividing multichromatic light passing through the grating into spacially separate spectral regions, comprising a substantially planar dielectric plate having a thickness which varies as a repetitive, stepped function of location on the plate, said function being chosen to produce optical path length differences, in said light, which are integral multiples of a selected wavelength.

4,277,139
SCULPTURED OPTICAL ART FORM

Michael Cox, 1311 Dixie Hwy. S., Pompano Beach, Fla. 33060

Filed Dec. 12, 1977, Ser. No. 859,384
Int. Cl.[3] G02B *27/24, 5/04*
U.S. Cl. 350—286 7 Claims



1. A method for optically producing a visual image of a three dimensionally complete object in a transparent medium comprising the steps of:
(a) selecting a transparent geometrical solid of a particular shape having at least one wall observable of internal light reflection; and
(b) forming a cavity in the wall having the observable internal reflection, said cavity being formed in the shape of a symmetrical one half of the three dimensional visual image displayed.

4,277,140

VEHICLE REARVIEW MIRRORS

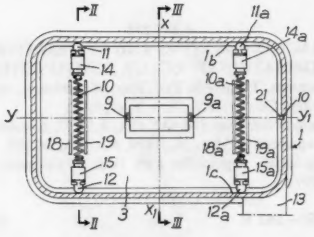
Stephane Manzoni, 1, rue Pasteur, Saint Claude, France (39200)

Filed Mar. 13, 1980, Ser. No. 130,101

Claims priority, application France, Mar. 23, 1979, 79 07429

Int. Cl.³ G02B *5/08*; B60R *1/02*

U.S. Cl. 350—288 **7 Claims**



1. An improvement to vehicle rearview mirrors, comprising a mirror fitted on a support member pivotally mounted in the central part of the base of a casing, wherein at the back of the mirror-supporting member is mounted at least one resilient member whose axis is situated in a plane parallel to the plane of the mirror and whose two ends are resting against the opposed side faces of the casing, said resilient member being engaged in at least two guide members fast with the mirror-supporting member.

4,277,141

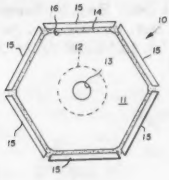
MULTIFACETED MIRROR AND ASSEMBLY FIXTURE AND METHOD OF MAKING SUCH MIRROR

Joseph P. Kleiber, Ontario, N.Y., assignor to Tropel, Inc., Fairport, N.Y.

Continuation-in-part of Ser. No. 24,656, Mar. 28, 1979, abandoned. This application Jan. 31, 1980, Ser. No. 117,046

Int. Cl.³ G02B *7/18*; B29D *11/00*

U.S. Cl. 350—299 **26 Claims**



1. A method of making a multifaceted mirror having a plurality of faces disposed in respective planes that are angled relative to each other, said method comprising:

a. making a plurality of individual mirrors sized to form the faces of said multifaceted mirror;

b. positioning each of said individual mirrors accurately in the planes of the respective faces of said multifaceted mirror and holding said individual mirrors securely in position;

c. locating a support element adjacent said positions of said individual mirrors;

d. filling gaps between said support element and said individual mirrors with a cement that bonds said individual mirrors securely to said support element while said individual mirrors are held in said positions, said individual mirrors bonded to said support element forming said multifaceted mirror; and

e. placing trim strips between each of said individual mirrors after said individual mirrors are bonded to said support element.

4,277,142

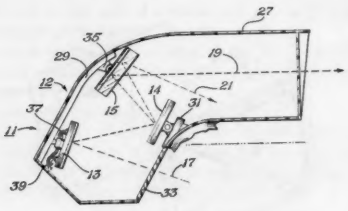
PERISCOPIC MIRROR

Billy R. Gardner, 3825 Wilshire, Abilene, Tex. 79603

Filed Apr. 10, 1980, Ser. No. 138,926

Int. Cl.³ G02B *7/18*

U.S. Cl. 350—302 **2 Claims**



1. A periscopic mirror for excellent visibility of a driver of a vehicle both rearwardly and to the sides of the vehicle comprising:

a. a structure carrying a plurality of mirrors and affixed exteriorly of the vehicle; said structure including a housing with transparent rear and side sections for preventing getting said mirrors dirty without restricting visibility; said housing being mounted near the center of the roof of said vehicle and having a lower mirror below the top of a windshield of the vehicle so as to be visible to the driver;

b. said first lower, adjustable mirror being disposed interiorly of and carried by said structure and facing the driver and adjustable to reflect a second mirror; said lower, adjustable mirror being connected with the an elongate adjusting means for adjusting the mirror to the line of eyesight of the driver; said elongate adjusting means being disposed interiorly of the vehicle and accessible to the driver;

c. a second mirror disposed rearwardly of said structure and said first mirror; said mirror being mounted so as to reflect the line of sight of the driver from said first lower, adjustable mirror to a third set of mirrors; and

d. a third set of mirrors carried by said structure; said third set including a rearview mirror and respective right and left wing mirrors; said rearview mirror being positioned and adapted to reflect the view rearwardly of said vehicle to the driver via said second and first mirrors; said right wing mirror being adapted and positioned to reflect the view to the right and downward side of said vehicle to the driver via said second and first mirrors; said left wing mirror being adapted and positioned to reflect the view to the left and downward side of said vehicle to the driver via said second and first mirrors;

such that substantially one hundred and eighty degrees of visibility is assessible to the driver for an exceptionally high degree of safety.

4,277,143

LIQUID CRYSTAL CELL HAVING ELECTRODES ON ADJACENT PLATES CONNECTED BY A CONTACT BRIDGE AND THE PROCESS OF PRODUCING SAME

Arthur G. Pauli; Reinhart Schade, and Karl Stiel, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,824

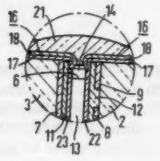
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735493

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—334 **7 Claims**

1. A process of forming a liquid crystal cell having a pair of

carrier plates spaced apart by a frame, each of said carrier plates being provided with electrically conductive coatings on an inner surface thereof with at least one electrical conductive coating on one plate forming an electrode connected to a terminal electrode on the other plate by a conductive bridge consisting of at least one metallized layer which engages only an edge surface of each of said electrodes which edge surface lies in the plane of the end surface of the carrier plate, said process including providing a first plate member having the first conductive coatings disposed thereon in a plurality of repeating patterns, providing a second plate member having the second conductive coatings provided thereon in a plurality of repeating patterns, covering the entire first conductive



coatings of the first plate member with an insulating layer, covering the second conductive coatings of the second plate member with an insulating layer, subsequent to the steps of covering the plate members with insulating layers securing said plate members together with frames, subdividing each of said plate member into individual carrier plates of the cell with the step of subdividing providing the edge surface of each of the electrodes on the end surfaces of the carrier plate, and subsequent to the step of securing said plates with a frame applying at least one metallized layer on said edge surfaces of the electrodes and an end surface of the plates to form said conductive bridge engaging the electrodes only at said edge surfaces.

4,277,144

ELECTRO-OPTIC PASSIVE DISPLAY CELL

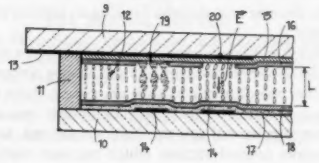
Eric Saurer, Bevaix; Fereydoun Gharadjedaghi, Neuchatel; Claude Laesser, La Chaux-de-fonds; Rene Viennet, Neuchatel, and Yves Ruedin, Saint-Blaise, all of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Mar. 20, 1979, Ser. No. 22,199

Claims priority, application Switzerland, Mar. 22, 1978, 3135/78

Int. Cl.³ G02F *1//13*

U.S. Cl. 350—349 **5 Claims**



1. An electro-optic display cell comprising:

A. two plates arranged adjacent one another and providing a space therebetween, at least one of the plates being transparent and both plates having an inner surface arranged adjacent the other;

B. electrodes carried on the inner surfaces of the plates to form display zones, in which display zones, electric fields may be created;

C. a layer of a mixture of a nematic liquid crystal having a positive dielectric anisotropy, an optically active component and dichroic molecules, the mixture filling the space between the plates and having a median zone, the mixture having a critical thickness in the presence of a homeotropic alignment layer on each of the inner surfaces of the plates such that for a thickness of the mixture less than this critical thickness, the molecules of the mixture have a homeotropic structure through the whole structure of the mixture and for a thickness of the mixture greater than the critical thickness, the molecules of the mixture have a helicoidal structure in the median zone, and the mixture having a homeotropic structure in the presence of an electric field;

D. in the areas of the inner surface situated outside the display zones there is a homeotropic alignment layer on each of the inner surfaces of the plates and the thickness of the mixture is less than the critical thickness so that the molecules of the mixture have a homeotropic structure through the whole thickness of the mixture and the mixture is transparent; and

E. in the display zones, in the absence of any electric field, the molecules of the mixture have a helicoidal structure and are absorbent, while in the presence of an electric field, the molecules of the mixture have a homeotropic structure and are transparent so that the non-activated display zones are dark on a transparent background.

4,277,145

LIQUID-CRYSTAL DISPLAY DEVICE

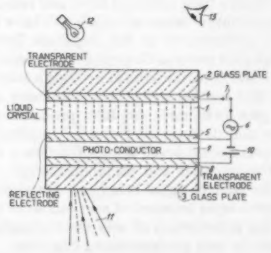
Michel Hareng; Serge Le Berre, and Pierre Leclerc, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 17, 1979, Ser. No. 104,550

Claims priority, application France, Dec. 15, 1978, 78 35382

Int. Cl.³ G02F *1//135*

U.S. Cl. 350—351 **4 Claims**



1. A liquid-crystal display device for visualizing information and comprising:

a first and a second transparent plates;

a smectic liquid-crystal layer inserted between said first and second transparent plates;

a layer of photoconductive materials inserted between said liquid-crystal layer and said second transparent plate;

a first electrode transparent to heat and inserted between said liquid-crystal layer and said layer of photoconductive material;

a second electrode transparent to light and inserted between said layer of photoconductive material and said second transparent plate;

means for temporarily illuminating said layer of photoconductive material at points representing said information to be visualized in order to cause said photoconductive material to conduct at said points;

means for supplying said first and second electrodes with a first voltage in order to heat said layer of photoconductive material at said points which have been made conductive by said illuminating means, thus causing transition of the liquid-crystal layer to the isotropic state at locations in which said layer is adjacent to said points and producing light-scattering action of the liquid-crystal layer when the

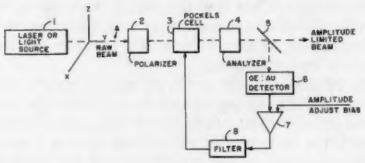
temporary illumination is stopped and said layer returns to the smectic state.

4,277,146

VISIBLE AND INFRARED INTENSITY LIMITER

Robert L. Morgan, Huntland, Tenn.; Larry T. Cupitt, Cary, N.C., and William L. Gamble, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 19, 1979, Ser. No. 59,020
Int. Cl.³ G02F *1/03*
U.S. Cl. 350—356 **1 Claim**



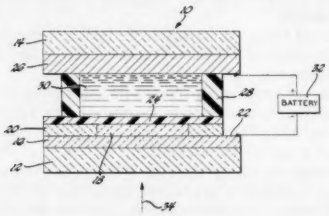
1. A system for controlling the amplitude of laser light from a laser comprising: a polarizer for polarizing said light in a predetermined direction; an electro-optic pockels cell having a control input terminal; an analyzer being polarized such that it will pass electromagnetic energy polarized in said predetermined direction and will cut off electromagnetic energy polarized 90° to said predetermined direction; said polarizer, cell and analyzer being positioned such that the light will pass through said polarizer, cell and analyzer in that order; a partial reflector being positioned to reflect a portion of the light output passing through said analyzer; a germanium detector positioned to receive light reflected from said reflector; said detector having an output terminal which will have a signal thereon which is representative of the amplitude level of said laser light; a high gain switchable amplifier connected to the output terminal of said detector so as to provide a control signal when said laser light reaches a preselected intensity amplitude level; said high gain switchable amplifier produces a control signal only when said detector measures an amplitude level greater than said preselected level; a high frequency filter connected between the amplifier and the control input of said pockels cell; and the control signal being connected through the filter to the control input terminal of said cell so as to cause the cell to rotate the polarization of said electromagnetic energy 90° with respect to said predetermined direction.

4,277,147

DISPLAY DEVICE HAVING REDUCED ELECTROCHROMIC FILM DISSOLUTION

Thomas C. Arnoldussen, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 15, 1979, Ser. No. 3,245
Int. Cl.³ G02F *1/17*
U.S. Cl. 350—357 **5 Claims**



1. An electrochromic device having an electrochromic transition metal oxide film whose electromagnetic radiation transmitting properties are alterable in response to an electric field, said device comprising

a supported transparent electrode,

an electrochromic transition metal oxide film in electrical contact with said electrode,

a proton-conductive, acid-resistant, nonporous polyhydroxyl polymer layer applied to said electrochromic film,

an acidic aqueous electrolyte in contact with said polymer layer and

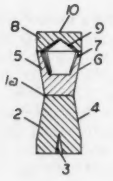
a suitable counterelectrode in contact with said electrolyte.

4,277,148

CONICAL SPLIT-IMAGE MICROSCOPIC LENS

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Nov. 24, 1980, Ser. No. 209,865
Int. Cl.³ G02B *5/04*
U.S. Cl. 350—432 **1 Claim**



1. A microscopic lens comprising three component lenses, with each component lens having one or two conical sections with surfaces which refract light rays at prescribed angles, with all conical sections of the component lenses being aligned on a common axis which is parallel to the light rays entering and emanating from the component lenses, with all surfaces of the component lenses not used for the refraction and transmission of light rays being opaque,

(a) with a lower component lens being positioned above an object and having a concave conical section which receives parallel rays emanating from the object and refracts these rays outward from the common axis at a prescribed angle, and having a convex conical section which receives rays emanating from the concave conical section of the lower component lens and refracts these rays parallel to the common axis, thereby forming an annular image of the object,

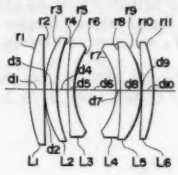
(b) with a middle component lens being above and adjacent to the lower component lens and having a convex conical section which receives rays emanating from the convex conical section of the lower component lens and refracts these rays inward toward the common axis, and having a concave conical section which receives rays emanating from the convex conical section of the middle component lens and refracts these rays inward toward the common axis,

(c) and with an upper component lens being above and adjacent to the middle component lens and having a concave conical section which receives rays emanating from the concave conical section of the middle component lens and refracts these rays parallel to the common axis, forming an enlarged whole image of the object, and having a planar section which receives rays emanating from the concave conical section of the upper component lens and transmits these rays out of the upper component lens in a direction parallel to the common axis.

4,277,149
MODIFIED GAUSS TYPE LENS SYSTEM

Kunihiko Konoma, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 5, 1978, Ser. No. 939,381
Claims priority, application Japan, Sep. 7, 1977, 52/108249
Int. Cl.³ G02B 9/60
U.S. Cl. 350—467 **21 Claims**



1. A modified Gauss type lens system of 5 groups and 6 lens elements comprising from the object to the image side:

a first group consisting of a first positive lens element, the absolute value of the radius of curvature of the object side surface of the first element being less than that of the image side surface;

a second group consisting of a second positive meniscus lens element convex to the object side;

a third group consisting of a third negative meniscus lens element convex to the object side;

a fourth group consisting of a meniscus-shaped negative doublet convex to the image side and constructed by a fourth negative lens element and a fifth positive lens element cemented thereto; and

a fifth group consisting of a sixth positive lens element, the absolute value of the radius of curvature of the object side surface of the sixth element being greater than that of the image side surface,

the lens system being further characterized by its relatively long back focal distance which is defined to be greater than 75 percent of the focal length of the whole lens system and the lens system further fulfills the following conditions:

$29<\nu_3,\nu_4<40$

$1.72<(N_1+N_2+N_5+N_6)/4<1.77$

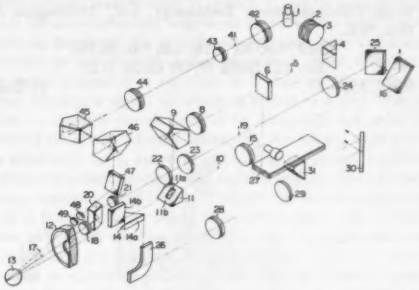
wherein ν_3 and ν_4 represent the Abbe numbers of the glass materials for the third and fourth lens elements, and N_1, N_2, N_5 and N_6 represent refractive indexes of glass materials for the first, second, fifth and sixth lens elements, respectively.

4,277,150
EYE REFRACTMETER

Shinzi Wada; Ikuo Kitao; Yasuo Kato, and Taketoshi Ishihara, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,608
Claims priority, application Japan, Aug. 24, 1977, 52-101239; Aug. 24, 1977, 52-101240; Feb. 3, 1978, 53-12192[U]; Feb. 4, 1978, 53-11610
Int. Cl.³ G03B 29/00; A61B 3/14, 3/10
U.S. Cl. 351—13 **13 Claims**

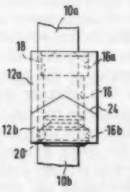
12. An eye refractmeter comprising a target projecting optical system for projecting an image of a target means through a pupil of a patient's eye to produce a target image on the retina of the eye, an observing optical system including objective lens means for observing the target image through the pupil, a sighting optical system for observing the cornea of the eye to determine that the objective lens means is appropriately spaced from the patient's eye, and an alignment mark projecting system having an alignment mark projecting axis lying in a first plane which is perpendicular to a second plane including the observing and sighting optical systems, said alignment mark projecting system including a first mark comprised of at least one line parallel to said first plane, said sighting optical system including a second mark comprised of at least one line parallel to said second plane.



4,277,151
METAL FRAME FOR EYEGLASSES

Kurt Schönhut, Schwäbisch Gmünd-Wetzgau, Fed. Rep. of Germany, assignor to Ferdinand Menrad, Schwäbisch Gmünd-Bettringen NW, Fed. Rep. of Germany

Filed Sep. 22, 1978, Ser. No. 944,671
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749796
Int. Cl.³ G02C 13/00
U.S. Cl. 351—41 **8 Claims**



1. A metal frame for eyeglasses comprising:

a pair of rims, each of which is configured to surround and support an eyeglass lens;

a locking bar having a bore extending therethrough secured to each of said rims, said locking bar and said rim to which it is secured being separated by a V-shaped separation slot so as to divide said rim and said bar into first and second rim segments and first and second locking bar segments respectively, said second locking bar segment having an abutment adjacent to an end thereof distal from said first locking bar segment;

a jacket having an internally threaded bore which is, in turn, received in at least said bore of said locking bar encompassed by said first locking bar segment thereof and which is coupled to said first locking bar segment to prevent movement thereof, relative to said first locking bar segment, towards said second locking bar segment; and

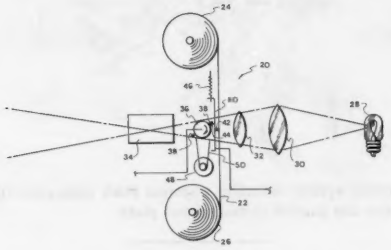
a locking bar screw having a head portion and a threaded shaft, the former of which is in abutting engagement with said abutment of said second locking bar segment and the latter of which is inserted through said distal end of said second locking bar segment so as to be in threaded engagement with said bore of said jacket and so as to thereby detachably secure said first and second locking bar segments together.

4,277,152

CONTROLS FOR SYNCHRONIZING AUDIO SIGNALS WITH FILM ADVANCEMENT IN A PROJECTOR

Stanford E. Taylor, Lloyd Harbor, N.Y., assignor to Instructional/Communications Technology, Inc., Huntington Station, N.Y.

Filed Nov. 30, 1979, Ser. No. 98,758
Int. Cl.[3] B03B 31/00; G03B 1/22
U.S. Cl. 352—17 11 Claims



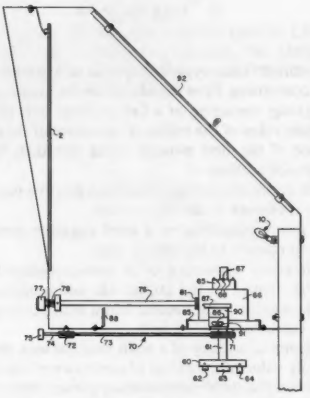
1. In a synchronized audio visual system including an audio program source capable of producing a film advance signal at predetermined intervals, a projector having a source of light for passing light through an aperture in the projector and means for directing film along a pathway into and out of alignment with the aperture for projection of individual frames in sequence, drive means for initiating advance of the film in response to advance signals from the audio source in a predetermined sequence, advance means responsive to the drive means to advance the film, the advance means including a rotating member with a drive projection extending therefrom for rotation into and out of engagement with film support and drive structure for the film, the improvement comprising; limit means for controlling the time period of advancement of film as a function of each stroke of the rotating member and in relationship of this to a film advance signal from the audio source, the limit means including the rotating member forming a switch connected to the drive means and closing a circuit when in contact with the drive structure for the film and opening the circuit otherwise thereby controlling the period of film advance and synchronizing the film advance with the audio program source, the drive means including a motor, the rotating member and the drive structure being electrically isolated from ground, the rotating member being connected to the motor and the drive structure being grounded thereby providing a closed circuit when the rotating member contacts the drive structure and opening the circuit when the rotating member is out of contact with the drive structure, the length of time when the circuit is closed depending upon the relative positioning of the rotating member and the drive structure and the length of time the rotating member is in contact with the drive structure, the drive structure for the film including a pawl mechanism including spring means adjacent the aperture and normally in a retracted position in alignment with a slot adjacent to the aperture, the rotating member in position to bias the spring to direct the pawl mechanism through the slot into engagement with a perforation in the film and then along the slot a predetermined distance to advance the film and then release the pawl mechanism permitting the spring to return the pawl to the retracted position out of the slot, the pawl mechanism including an elongated leaf with the pawl extending downwardly therefrom intermediate its ends, a drive projection extending from the side of the elongated leaf spring opposite to the pawl in position to be engaged by the rotating member, the elongated leaf spring being slidably positioned so that engagement of the rotating member with the drive projection and application of a force thereto will bias the leaf spring until the pawl extends through the slot into engagement with a perforation in the film and then the leaf spring will be slidably moved by the rotating member and the film accordingly advanced and when the rotating member disengages from the leaf spring the leaf spring will return to its initial configuration with the pawl disengaged from the film and withdrawn through the slot whereupon return means can return the leaf spring to the normal retracted position.

4,277,153

X-RAY MICROFILM READER

Alexander J. Zabik, West Park, and Stephen G. Fisher, Rhinebeck, both of N.Y., assignors to Medrex Ltd., West Park, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,678
Int. Cl.[3] G03B 23/08, 21/10, 21/28
U.S. Cl. 353—27 R 8 Claims



1. An X-ray microfilm reader comprising:

means receptive of the microfilm medium for holding same in a working position;

a light source disposed below the working position;

a dichroic mirror receptive of the light from the light source for reflecting same towards the microfilm medium in the working position;

condensor means receptive of the reflected light from the mirror for condensing same prior to passage through the microfilm medium in the working position;

a screen;

optical means disposed above the working position and receptive of the condensed light passing through the microfilm medium for effecting the display of the image carried therewith on the screen, wherein the optical means comprises a lens turret having a plurality of projection lenses thereon, means mounting the lens turret for rotation to successively position each of the lenses over the working position of the microfilm medium comprising a hollow cylindrical member, a shaft rotatably received in the hollow member and fixed to the turret, a first gear wheel on the shaft, a second rotatably mounted gear wheel spaced from the first gear wheel and having a rod connected thereto for selectively manually rotating the second gear wheel, a gear belt connecting the two gear wheels to impart rotation to the turret in response to movement of the rod, detents on the top end of the hollow cylindrical member and projecting pins at the top end of the shaft engageable with the detents to define operational positions for each projection lens and means for focusing the selected projection lens comprising a rack gear along the longitudinal length of the hollow cylindrical member, a focusing block having a third gear wheel and slidably receptive of the hollow cylindrical member therein for vertical movement with the third gear wheel in engage-

ment with the rack gear and a manually rotatable focusing rod connected to the third gear wheel and rotatable therewith to effect focusing the projection lenses; and

an image mirror disposed above the optical means for receiving the image passing through the optical means for reflecting same onto the screen.

4,277,154

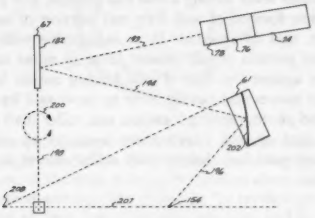
OPTICAL SYSTEM FOR ELECTRO-OPTICAL SCANNER

Steven Sakabinos, Cos Cob, Conn., assignor to Eltra Corporation, Toledo, Ohio

Filed Nov. 19, 1979, Ser. No. 95,895

Int. Cl.³ B41B *21/08*; G02B *27/17*

U.S. Cl. 354—5 **23 Claims**



1. An electrophotographic typesetting system having a scanning means for scanning a light sensitive image support surface with an information containing light beam and for imaging said information on said surface, said system having means for driving the light beam through a curvilinear light path, means for converting said curvilinear light path to a straight line scanning locus at said surface, means supporting said surface and moving said image support surface, means providing information in digitized format including means for providing first digital data defining the identity and location of characters, font storage means providing second digital data defining the contour of a plurality of characters with respect to a normalized encoded set of first and second coordinates, digital processing means connected to said first and second digital data for producing third digital data defining said characters, means for modulating the light beam responsive to said third digital information, said system including an optical assembly, said optical assembly having surfaces referenced to each other for mounting said means for scanning, said means to convert said curvilinear light path and said means for supporting and moving said image support surface, whereby said scanning means, said means for converting said curvilinear light path and said means for supporting and moving said image support surface are referenced to said referenced surfaces and to each other.

4,277,155

CONTROL DEVICE FOR PHOTOGRAPHIC CAMERAS

Waldemar Rentschler; Franz Starp, and Winfried Espig, all of Wildbad, Fed. Rep. of Germany, assignors to Prontor-Werk Alfred Gauthier GmbH, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 73,756

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840185

Int. Cl.³ G03B *7/097, 15/03*

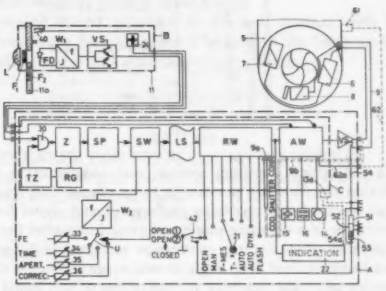
U.S. Cl. 354—23 D **31 Claims**

1. Separate control device for photographic cameras such as professional cameras, comprising

a circuit device for setting, measuring and controlling shutter exposure values, to which an independent electromagnetically drivable shutter assembly for such a camera is adapted to be exchangeably connected for energized operation thereby, and

an independent light meter probe detachably connectable to the circuit device and which contains a photoelectric transformer, a probe current to frequency converter and an amplifier for providing a brightness signal to the circuit device,

wherein the circuit device includes an energizable electronic control circuit arrangement in which a gate is provided to which the corresponding brightness signal of the light meter probe and the signal of a periodically operating gate time pulse generator are supplied, such that the output signal of the gate time pulse generator is supplied to a counter the resultant output brightness signal of which is stored in a first storage system, a control circuit current to frequency converter is provided which transforms selectively the analog values for film sensitivity, time, aperture and correction factor, supplied by means of potentiometers, into suitable frequencies, a second storage system is provided into which the stored brightness signal is fed and via a change-over arrangement one or more values selectively for film sensitivity, time, aperture and correction factor are supplied, a listing storage system in turn is provided in which the arriving pulse series are stored, a mode selector device connected with a computer are provided by means of which at least the following operating modes are selectable:



(a) operation with manual setting of both of the exposure parameters time and aperture,

(b) operation with automatic control of one of the two exposure parameters time or aperture, in dependence upon lighting intensity, after manual presetting of the value of the other of such exposure parameters and of the film sensitivity,

(c) operation with the taking of measurements enabling the determination of one of the two exposure parameters time or aperture, by means of the light meter probe, taking into account the film sensitivity and light intensity, or

(d) operation with settings for opening and retaining in open position the electromagnetically drivable shutter assembly over a selective optional length of time,

whereby the values stored in the listing storage system are processed, in accordance with the setting of the selector device, in the computer to ascertain the corresponding processed values, an indicator display arrangement is provided which indicates the computer ascertained values, and an operating mechanism circuit is provided by means of which the values ascertained in the computer may be controlled.

4,277,156

FOCUSING POSITION DETECTION APPARATUS

Yoshio Fukushima, Machida, and Yoshiaki Kanmoto, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jun. 6, 1979, Ser. No. 45,937

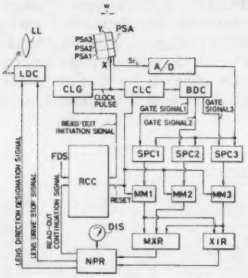
Claims priority, application Japan, Jun. 10, 1978, 53/69990

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—25 **11 Claims**

1. In a focusing position detection apparatus for focusing an image on an image formation surface with an optical focusing system having means for changing the focusing position thereof, an improvement comprising: a single photoelectric

conversion element adjacent the image formation surface having three signal forming portions each with a light receiving surface disposed at a different optical distance from the optical focusing system, the effective optical distances of said respective signal forming portions increasing from one end of said photoelectric conversion element to an opposite end thereof, measuring means connected to said signal forming portions for measuring respective signals produced thereby, and analyzing means connected to said measuring means for evaluating the respective signals from said measuring means, said analyzing means connected to said means for changing the focusing position of said optical focusing system in accordance with said evaluation to focus an image on the image formation surface



with the optical focusing system, and indicating in which direction the focusing position is to be changed to focus the image, each of said receiving surfaces of said signal forming portions lie in a common plane and extend one after the other across said photoelectric conversion element, said common plane being inclined at an angle to said image formation surface whereby said light receiving surface of one of said signal forming portions at one end of said photoelectric conversion element is closer to the optical system than said light receiving surface of one of said signal forming portions on an opposite end of said photoelectric conversion element whereby the differences in said effective optical distances comprises physical differences in distance.

4,277,157

LENS TUBE RETRACTION MECHANISM FOR CAMERA HAVING RETRACTABLE LENS TUBE

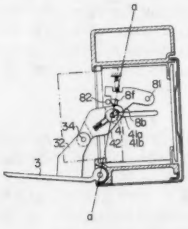
Fumihiro Miyagawa, and Kousaku Sawabe, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 30, 1979, Ser. No. 43,665

Claims priority, application Japan, Jun. 6, 1978, 53/68059; Jun. 15, 1978, 53/72832

Int. Cl.³ G03B *17/04*

U.S. Cl. 354—187 **3 Claims**



1. In a camera of the type having a retractable lens tube, the invention comprising:

a lens tube movable between a photographing location and a retracted location in the camera;

a roller with a shaft engaged with part of said lens tube;

an intermediate lever for moving said roller between a first position for placing said lens tube at said photographic location and a second position for placing said lens tube at said retracted location, said intermediate lever having a slot for receiving and permitting movement of said roller shaft therein;

an operation member pivotally connected at a link to said intermediate lever for moving said lens tube;

a pusher lever to hold said lens tube at photographing location movably mounted to the camera and having a surface engageable with said roller to push said roller when said lens tube is in and near said photographing location; and

biasing means connected to said pusher lever to bias said pusher lever toward said roller;

said pusher lever having a free end portion, and a projected portion formed at said free end portion of said pusher lever, said intermediate lever engageable with said projected portion of said pusher lever to move said pusher lever against the bias of said biasing means before said roller moves said pusher lever to move said lens tube out of said photographing location, said roller shaft moving in said slot of said intermediate lever to an end thereof toward said link before said roller moves said pusher lever.

4,277,158

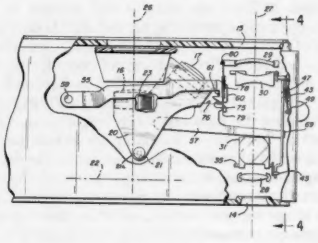
CAMERA

Arthur Zawodny, Budd Lake, N.J., assignor to Keystone Camera Corporation, Clifton, N.J.

Continuation of Ser. No. 856,841, Dec. 2, 1977. This application Dec. 10, 1979, Ser. No. 101,409

Int. Cl.³ G03B *3/00, 13/10*

U.S. Cl. 354—197 **14 Claims**



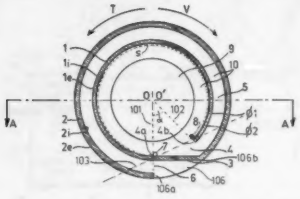
1. A photographic camera having an objective optical axis and a viewfinder optical axis comprising: a first and a second objective lens; corresponding first and second viewfinder lenses; each objective lens and each viewfinder lens being selectively movable to or from a stored position out of alignment with an optical axis and an operating position in alignment with an optical axis whereby only one of said objective lenses and one of said viewfinder lenses is operative at any particular moment; each of said viewfinder lenses being rotatable about an axis substantially along one edge thereof betwen said stored position and said operative position; connecting means for moving said first viewfinder lens to its operating position and said second viewfinder lens to its stored position upon movement of said first objective lens to its operating position and alternatively to move said second viewfinder lens to its operating position and said first viewfinder lens to its stored position upon movement of said second objective lens to its operating position; said connecting means comprising an elongated actuator slide in operable engagement with each of said viewfinder lenses and being positioned and movable parallel to said viewfinder optical axis.

4,277,159

PHOTO-PROCESSING DRUM WITH NON-REUSABLE CHEMICALS, FOR USE IN DAYLIGHT CONDITIONS, FOR PROCESSING PHOTO-SENSITIVE SURFACES WITH FLEXIBLE SUPPORTS

Maurice J. Descotes, L'Amenokal Rte. de Nages, Langlade, France (30980)

Filed Sep. 17, 1979, Ser. No. 76,153
Claims priority, application France, Sep. 18, 1978, 78 26649
Int. Cl.³ G03D *13/04*
U.S. Cl. 354—312 **12 Claims**



1. A photo-processing drum with non-reusable chemicals for use in daylight conditions for processing photographic sensitive surfaces, of the type moving in rotation about its horizontal longitudinal axis in a first direction for recurringly dipping the sensitive surface in a processing solution, and in a second reverse direction for draining off the said processing solution from the said drum, and comprising:

an inner cylinder having two ends, a longitudinal axis, and a wall of circular cross-section,

a slot provided in the wall of said inner cylinder and having longitudinal edges defining with the axis of said inner cylinder two radial planes oriented at an angle of about 45° with respect to each other,

an outer cylinder having two ends and a diameter greater than the one of said inner cylinder and being disposed concentrically around said inner cylinder,

a built-in bottom wall tightly sealing one of the ends of said inner and outer cylinders,

a removable cover adapted to tightly seal off the end of said inner and outer cylinders,

a removable cover adapted to tightly seal off the end of said inner cylinder opposite to its bottom wall,

a longitudinal slot cut in the wall of said outer cylinder, having two longitudinal edges and being positioned with respect to the slot of said inner cylinder so that the slot of said outer cylinder is situated at least approximately between the said two radial planes,

a joining wall connecting one of said longitudinal edges of the slot of said inner cylinder to the opposite far edge of the slot of said outer cylinder, and

an annular draining passage delimited by said two concentric inner and outer cylinders, by said joining wall, by said bottom wall and by a built-in flange tightly sealing the end of said annular draining passage which faces said removable cover, the slot of the said outer cylinder forming an outlet for said draining passage.

4,277,160

ELECTROSTATIC PRINTER

Yoshihiro Yamada, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 6, 1979, Ser. No. 72,842
Claims priority, application Japan, Sep. 13, 1978, 53-125620[U]; Sep. 13, 1978, 53-125621[U]; Sep. 13, 1978, 53-125622[U]; Sep. 13, 1978, 53-125623[U]; Dec. 16, 1978, 53-172720[U]
Int. Cl.³ G03G *15/00, 21/00;* **G03B** *27/00*
U.S. Cl. 355—3 R **6 Claims**

1. An electrostatic printer comprising:

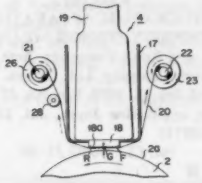
(1) a movable photosensitive body;

(2) means having a cathode ray tube and adapted to transmit a light image to the photosensitive body through an optical fiber plate located near the photosensitive body to form an electrostatic image on the photosensitive body;

(3) means for developing the electrostatic image;

(4) means for fixing a developed image to a paper;

(5) a transparent film provided between the photosensitive



body and the optical fiber plate such that it covers and contacts with the optical fiber plate, said transparent film being moved in a direction opposite to that in which the photosensitive body is moved; and

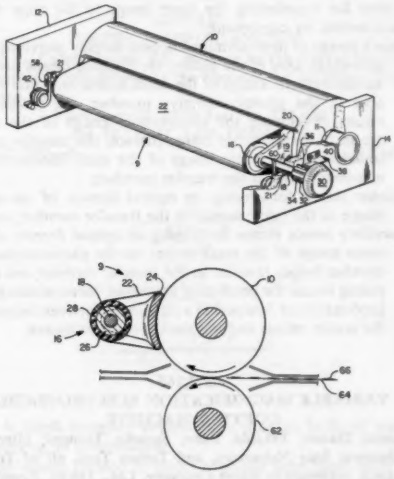
(6) urging means provided in pressure contact with the transparent film to impart a tension to the latter so that said film contacts said plate without slack.

4,277,161

CLEANER FOR PRESSURE FIXING ROLLER

Richard A. Calabrese, Newtown, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Dec. 10, 1979, Ser. No. 102,217
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 FU **8 Claims**



1. A cleaning device for a fixing roller in an electrostatic copying machine, comprising:

a cleaner support mountable adjacent said fixing roller;

a porous, oil-impregnated roller rotatably mounted adjacent said cleaner support;

a continuous cleaning endless felt member adjustably secured around said cleaner support and said oil-impregnated roller;

means for urging said endless felt member into wiping contact with said fixing roller; and

means for incrementally advancing said endless felt member past the fixing roller, whereby the portion of the felt in wiping contact with the fixing roller can be maintained clean.

4,277,162

ELECTROPHOTOGRAPHIC APPARATUS COMPRISING DENSITY SENSOR MEANS

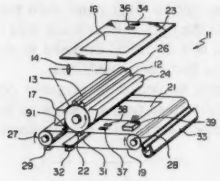
Nobuo Kasahara, and Kouji Yamanobe, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 12, 1979, Ser. No. 57,142

Claims priority, application Japan, Jul. 13, 1978, 53-85307; Jul. 19, 1978, 53-88775

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **15 Claims**



1. An electrophotographic apparatus having a platen for supporting an original document on an image area of the platen, a photoconductive member, imaging means for forming an electrostatic image of the original document on an image area of the photoconductive member, developing means for developing the electrostatic image to form a toner image, transfer means including a transfer member for supporting a copy sheet on an image area of the transfer member and moving the copy sheet into engagement with the photoconductive member for transferring the toner image to the copy sheet, characterized by comprising:

mark means of predetermined optical density provided on a non-image area of the platen, the imaging means forming an electrostatic image of the mark means on a non-image area of the photoconductive member, the developing means developing the electrostatic image of the mark means to form a toner image thereof, the transfer means transferring the toner image of the mark means onto a non-image area of the transfer member;

sensor means for sensing an optical density of the toner image of the mark means on the transfer member; and

auxiliary sensor means for sensing an optical density of the toner image of the mark means on the photoconductive member before transfer to the transfer member and computing means for producing an output corresponding to a predetermined function of a difference between outputs of the sensor means and the auxiliary sensor means.

4,277,163

VARIABLE MAGNIFICATION ELECTROSTATIC COPYING MACHINE

Masumi Ikesue; Takashi Yano; Susumu Tatsumi; Hiroyuki Idenawa; Isao Nakamura, and Tatsuo Tani, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 19, 1979, Ser. No. 59,082

Claims priority, application Japan, Jul. 21, 1978, 53-89093; Aug. 2, 1978, 53-93692

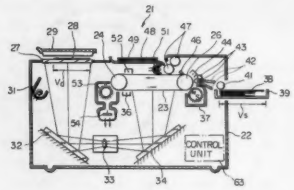
Int. Cl.³ G03G *15/00*; G03B *27/34, 27/40*

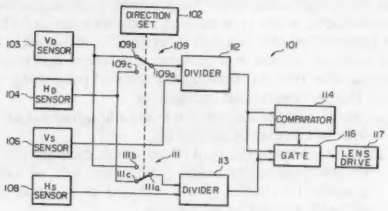
U.S. Cl. 355—14 R **12 Claims**

1. An electrostatic copying machine including a platen for supporting an original document, a photoconductive member, a variable magnification optical means for focussing a light image of the document onto the photoconductive member to form an electrostatic image, developing means for developing the electrostatic image to form a toner image, support means for supporting a copy sheet and transfer means for moving the copy sheet from the support means into toner image transferring engagement with the photoconductive member, characterized by comprising:

sensor means for sensing a vertical length and a horizontal length of the document on the platen; and

computing means for comparing the vertical and horizontal lengths of the document with vertical and horizontal lengths of the copy sheet and adjusting a reduction ratio of the optical means to a value such that a maximum length





of the light image of the document is substantially equal to a corresponding one of the vertical and horizontal lengths of the copy sheet;

the computing means comprising means for dividing the vertical length of the document by the vertical length of the copy sheet to obtain a first ratio, dividing the horizontal length of the document by the horizontal length of the copy sheet to obtain a second ratio, comparing the first ratio with the second ratio and adjusting the reduction ratio of the optical means to be substantially equal to a largest one of the first and second ratios.

4,277,164

PHOTOCOPIER PHOTOCONDUCTIVE SHEET HOLDING DEVICE

Hermann Fortmann, Bremen, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Jul. 16, 1979, Ser. No. 57,995

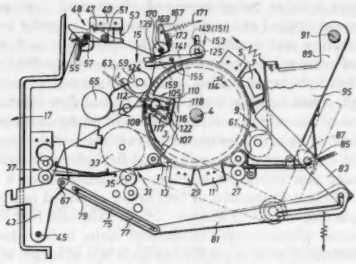
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2830955

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—16 **4 Claims**

1. In an electrophotographic copier including a replaceable photoconductive sheet having a leading edge portion and a trailing edge portion which sheet is composed of a conductive layer and a nonconductive coating on the layer; a guide drum rotatably supported by a drum shaft and having a circumferential surface for supporting the sheet and a holding device for securing the leading sheet edge portion to the guide drum; a charging station, an illuminating station, a developing station, a transfer station and a conductive sheet cleaning station arranged in a circumferential distribution about the guide drum, the improvement wherein said holding device comprises: means defining a wedge-shaped slot disposed alongside the circumferential surface of said drum and delimited by a pair of

faces which converge toward the circumferential surface where they form an insertion opening for a photoconductive sheet; a wedge in the form of an electrically conductive circular rod loosely disposed in said wedge-shaped slot, said circular rod being provided with radially projecting conductive prongs capable of penetrating the nonconductive coating of the sheet



in order to contact the conductive layer when the photoconductive sheet is fastened to said guide drum by means of said holding device so as to ground the photoconductive sheet; and means urging said wedge toward said insertion opening for clamping a photoconductive sheet leading edge portion inserted in said slot between said wedge and one of said faces.

4,277,165

PHOTOCOPYING MACHINE EQUIPPED WITH VARIABLE MAGNIFICATION ARRANGEMENT

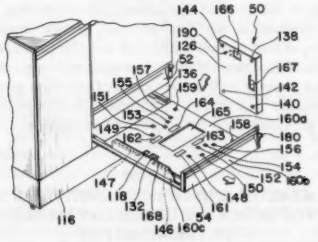
Kenichi Wada; Hiroshi Murasaki, both of Sakai; Yuji Enoguchi, Higashi Osaka, and Takao Fujiwara, Toyakawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 885,015, Mar. 9, 1978, abandoned. This application Feb. 1, 1979, Ser. No. 8,565

Claims priority, application Japan, Mar. 16, 1977, 52/29495

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—55 **6 Claims**



1. A photocopying machine equipped with a variable magnification arrangement for effecting production of photocopies on copy paper sheets of rectangular configuration at magnification equal to the size of an original document to be copied at magnification on a reduced scale from the original document, said photocopying machine comprising at least one cassette holding member provided on the main body side of said photocopying machine, said cassette holding member being adapted to receive thereon a first cassette lengthways and to receive thereon a second cassette selectively lengthways and sideways with respect to the direction of the transportation of the copy paper sheets, said first cassette accommodating therein the copy paper sheets of first size which is equivalent to the maximum reproducible size, said second cassette accommodating therein the copy paper sheet of second size the long side of which is shorter than the short side of the copy paper sheet of the first size, so that said second cassette is placed on said cassette holding member sideways for the copying at the equal size magnification and lengthways at the reduced size magnification with respect to the direction of transportation of the copy paper sheets.

4,277,166

EXPOSURE DEVICE

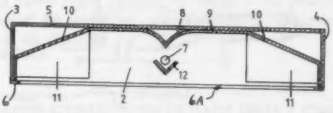
Petrus L. M. van Boven, Velden, and Leon M. W. Winthaegen, Maasbree, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Aug. 30, 1979, Ser. No. 71,016

Claims priority, application Netherlands, Sep. 1, 1978, 7808977

Int. Cl.³ G03G *15/00*; G03B *27/54*

U.S. Cl. 355—67 **9 Claims**



1. An exposure device for discharging limited transverse areas of a moving photoconductive element, comprising an elongate light reflecting housing adapted to be positioned transverse and close to said element and a light source in said housing, said housing comprising an elongate rear wall, two oppositely disposed elongate side walls and a fixed limited elongate opening at the housing front to overlie said element, said light source comprising a flash lamp disposed between said side walls substantially perpendicularly thereto, cover means between said lamp and said opening for preventing direct light radiation from said lamp to said element, and means disposed in said housing opposite to said opening and along said rear wall for reflecting light from said lamp through said opening.

4,277,167

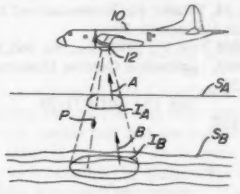
DEPTH MAPPING SYSTEM

Joseph C. Eppel, Wayne, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1976, Ser. No. 721,630

Int. Cl.³ G01C *3/08*; H04N *7/00*

U.S. Cl. 356—5 **8 Claims**



1. A depth mapping system for a selected body of water, comprising, in combination:

light means formed to direct a pulsed light beam onto the water surface and submerged bodies therebeneath;

receiving means having an array of light receptors each formed to receive reflections of the beam from discrete and separate areas of the water surface and the submerged bodies for producing a first signal when the water surface reflection is received, and a second signal when each submerged body reflection is received from its respective area; and

signal processing means connected to receive said first and second signals for producing a display corresponding to

said array indicative of the depth of respective surface areas of said submerged bodies.

4,277,168

ENDOSCOPE WITH MEANS FOR DETECTING ROTATION OF A DISTAL EXAMINING END

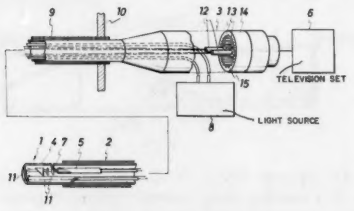
Toshio Oku, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1979, Ser. No. 27,946

Claims priority, application Japan, Apr. 20, 1978, 53/51483[U]

Int. Cl.³ A61B *1/00*

U.S. Cl. 356—138 **8 Claims**



1. An endoscope having a grip end and a distal examining end and means for observing what is viewed at said distal examining end,

said distal examining end being capable of being rotated under control from said grip end, an improvement comprising

a guide tube extending along said endoscope through which said endoscope passes,

said guide tube having a distal end proximately located to said distal examining end,

said guide tube being fixed and having no rotation imparted thereto, and

optical measuring means integrally formed at said distal end of said guide tube for optically measuring the amount of rotation imparted to the distal examining end of said endoscope.

4,277,169

DEVICE FOR SIMULTANEOUSLY PERFORMING ALIGNMENT AND SIGHTING OPERATIONS

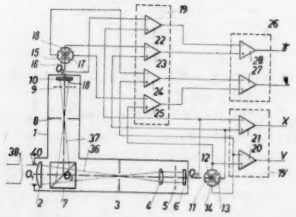
Werner Krieg, 14, Strasse der Kosmonauten, Jena, District of Gera, German Democratic Rep.

Filed Nov. 27, 1978, Ser. No. 960,716

Claims priority, application German Democratic Rep., Nov. 24, 1977, 202225

Int. Cl.³ G01B *11/26*

U.S. Cl. 356—152 **2 Claims**



1. Device for simultaneously performing alignment and sighting operations, comprising

a light source for emitting a bundle of parallel light being focused for infinity,

a measuring device, said light source and said measuring device being located remote from each other,

said measuring device located in an elongated housing having a light entrance opening in the front face comprising,

a first optical axis being at right angles to the light entrance opening, a second optical axis being at right angles to said first optical axis adjacent said light entrance opening, a beam splitter being arranged about said first and said second optical axis, said light entrance opening being for directing said bundle of parallel light into said housing, said beam splitter splitting said bundle of parallel light into a first light beam and into a second light beam, said second light beam being at right angles to said first light beam, a first photo electric transducer unit being arranged in a plane at right angles to the first optical axis, remote from said light entrance opening, said first photoelectric transducer unit being for alignment measurements, a second photoelectric transducer unit being arranged in a plane at right angles to said second optical axis, said first and said second photoelectric transducer units being identically constituted of four photocells each in a quadrant array, an optical system arranged about the first optical axis for imaging the entrance opening onto the first photo electric transducer unit,

electronic evaiuation unit comprising

first, second, and third difference amplifiers, said first, second and third difference amplifiers being provided with first and second inputs each, and with one output each, said first inputs of said first difference amplifiers and said second inputs of said first difference amplifiers being connected to said first and said second photo electric transducer units in such a manner that those photocells being arranged at the place of departure of the first and second light beam from said first, respectively, second optical axis are connected to a common one of said first difference amplifiers, said second inputs of said first difference amplifiers being further connected to said first and said second inputs, respectively, of said second difference amplifiers, the first and second inputs, respectively, of said third difference amplifiers being connected to the outputs of said first difference amplifiers in such a manner that the photocells of said second photoelectric transducer unit, being in diametrical opposition, are connected for direction evaluation, said first and said second inputs, respectively, of said second difference amplifiers and said second inputs of said first difference amplifiers being connected in such a manner to the photocells of said first photoelectric transducer unit that the photocells in diametrical opposition are connected for alignment evaluation.

4,277,170

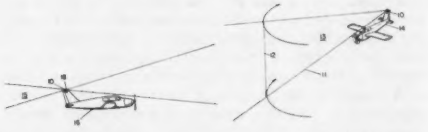
LASER BEACON AND OPTICAL DETECTOR SYSTEM FOR AIRCRAFT COLLISION HAZARD DETERMINATION

Richard B. Miles, D-16 Millstone River Apts., Princeton, N.J. 08540

Filed Nov. 1, 1979, Ser. No. 90,497

Int. Cl.³ G01B *11/26*; G01C *3/00, 5/00*

U.S. Cl. 356—152 **8 Claims**



1. An aircraft collision hazard determination system comprising:

laser beacon means mountable on a first aircraft including a laser light source which emits a polarized beam of light,

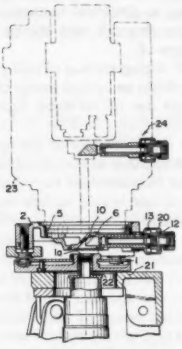
expanding means for optically expanding said beam into a vertically diverging and horizontally collimated fan-shaped beam, means for sweeping said fan-shaped beam 360° in azimuth while simultaneously rotating said beam 360° in polarization; and,

a pair of optical detection means mountable on a second aircraft for detecting light from said laser beacon means including means for detecting different polarized components of the light and converting said components into electronic signals proportional thereto, means for electronically processing said polarized components to produce a signal indicative of the polarization of the light, and means for comparing the detected polarization from each of said optical detection means to verify the consistency of the polarization of the light thereby reducing false signals.

4,277,171
BASE BOARD DEVICE FOR MEASURING INSTRUMENTS

Yasuo Iwafune, and Hideo Iwai, both of Tokyo, Japan, assignors to Tokyo Kogaku Kakai Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1979, Ser. No. 43,039
Claims priority, application Japan, May 31, 1978, 53-65187
Int. Cl.³ G01B *11/27*; G02B *27/32*
U.S. Cl. 356—153 **5 Claims**



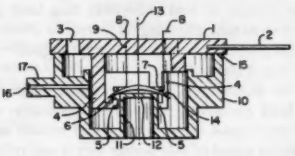
1. A combination of a measuring instrument having a first centering telescope and a base board device for mounting the measuring instrument, said measuring instrument having a body rotatable about an axis perpendicular to the base board, said base board device comprising a base board having a center, a second centering telescope having a viewing axis directed substantially toward the center of the base board, means for removably mounting a measuring instrument at a predetermined position, reflector means provided substantially at the center of the base board for refelecting the viewing axis of the second centering telescope perpendicularly downwardly with respect to the base board, aperture means formed in said base board at the center thereof, said reflector means being such that it permits observing a vertically downward position of said center of the base board through said first centering telescope and said aperture means.

4,277,172
SOFT CONTACT LENS APPARATUS

William D. Richards, Medway, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 5, 1979, Ser. No. 91,317
Int. Cl.³ G01N *21/13*
U.S. Cl. 356—244 **8 Claims**

1. Apparatus for transporting a soft contact lens and positioning the lens in a liquid for inspection which, comprises a main body member, a plurality of depending fingers extending from said member, each of said fingers having a lens supporting surface, said plurality of fingers defining a discontinuous recepticle for receiving the lens with clearance therearound,

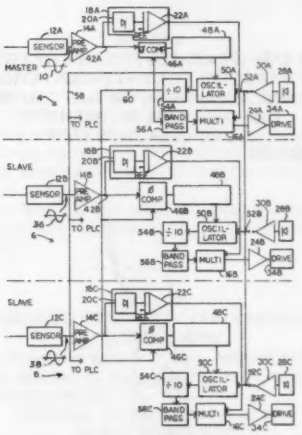


and weight means being adapted to rest on a lens positioned in the recepticle for reducing unintentional mvoement when immersed in the liquid.

4,277,173
RING LASER GYROSCOPE DITHER DRIVE CIRCUIT

Bo H. G. Ljung, Wayne, and Lincoln S. Ferriss, Lincoln Park, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Aug. 31, 1979, Ser. No. 71,611
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **10 Claims**



1. In a gyroscope system having a multiplicity of ring laser gyroscopes, wherein one of the ring laser gyroscopes is selected to act as the master unit and the remaining ring laser gyroscopes are selected to act as slave units, circuitry for providing phase lock between the dither drive motion of the master unit and the slave units comprising:

a multiplicity of circuits, one each for use with one each ring laser gyroscope, each of said circuits comprising:

means for sensing the dither motion of its respective ring laser gyroscope and for providing an electrical dither signal representative of said dither motion,

phase detection means having a dither signal input port for receiving said dither signal and a reference signal input port for receiving a reference signal, said phase detection means also having a phase difference output port for providing a phase difference signal representative of the phase difference between said dither signal and said reference signal,

a variable frequency oscillator having a drive signal output port for providing a drive signal, said oscillator having a phase difference signal input port for receiving said phase

difference signal and a random signal input port for receiving a random input signal, the frequency of said output drive signal varying in response to changes in said phase difference signal and said random input signal,

drive means for receiving said drive signal and for imparting dither motion to said respective ring laser gyroscope in response to said drive signal,

means for providing said random input signal to each of said master and slave units;

means for connecting the drive signal output port of said ring laser gyroscope selected as said master unit with the reference signal input port of said master unit such that said drive signal of said master unit is said reference signal; and

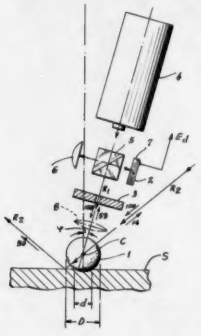
means for connecting said drive signal output port of said master unit to the reference signal input port of each of the ring laser gyroscopes selected to be slaves such that the drive signal of said master unit is said reference signal applied to each of said slave units whereby the signals at each dither signal port are in phase with the said reference signal and hence are in phase with themselves.

4,277,174

METHOD AND APPARATUS FOR THE MEASUREMENT OF HARDNESS TESTING INDENTATIONS

Claus Kleesattel, Apartado 4969, San Jose, Costa Rica

Filed Jan. 9, 1980, Ser. No. 110,779
Int. Cl.³ G01B *11/00, 11/08*
U.S. Cl. 356—372 **14 Claims**



1. The method of measuring the magnitude of spherical hardness testing indentations in testpiece surfaces utilizing a beam from a radiation source which is passed through a transparent indenter of at least partially spherical shape, the beam at the point of incidence being small with respect to the size of the indentation comprising the steps of:

passing said beam through the center of curvature of an at least partially spherical indenter,

tilting said beam about an axis parallel to the testpiece surface and coinciding with the center of curvature in the scanning plane, said tilting motion effected in at least one plane perpendicular to said testpiece surface,

measuring the intensity of the radiation reflected from the indentation in the direction of incidence, and

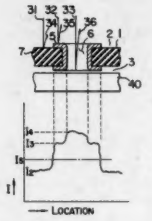
measuring the scanning angle between two intensity variations for determining the size of the indentation.

4,277,175

METHOD AND APPARATUS FOR INSPECTING PRINTED WIRING BOARDS

Koichi Karasaki, Hadano, and Yasuhiko Hara, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 11, 1979, Ser. No. 74,473
Claims priority, application Japan, Apr. 25, 1979, 54-50306
Int. Cl.³ G01B *11/00*
U.S. Cl. 356—378 **9 Claims**



1. A method of inspecting a printed wiring board including and insulating substrate having a wiring surface on which a wiring pattern is provided and including at least one plated through hole being in electrical connection with said wiring pattern and passing through said wiring board, the method comprising the steps of:

illuminating said wiring surface of said printed wiring board with light to obtain an optical image of said wiring surface at least by the use of reflected light from said wiring surface;

recognizing the light intensity of the optical images of said wiring pattern and that of the plated through hole as being at an identical first level of two digitized levels in said optical image of said wiring surface without distinguishing therebetween; and

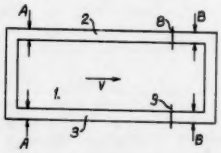
recognizing the light intensity of the optical image of said insulating substrate as being at a second level of said two digitized levels different from that of said light intensity of said wiring pattern and said plated through hole to distinguish said optical image of said insulating substrate from said images of said wiring pattern and said plated through hole.

4,277,176

METHOD AND APPARATUS FOR CHECKING THE WIDTH AND PARALLELISM OF MARGINS FOLLOWING THE CENTERING OF A PRINT WITH RESPECT TO A SUPPORT

Claude-Arnold Grosvernier, Hauterive, Switzerland, assignor to Compagnie Industrielle Radioelectrique, Gals, Switzerland

Filed Nov. 3, 1978, Ser. No. 957,345
Claims priority, application Switzerland, Nov. 4, 1977, 13418/77
Int. Cl.³ G01B *11/00, 11/14*
U.S. Cl. 356—394 **7 Claims**



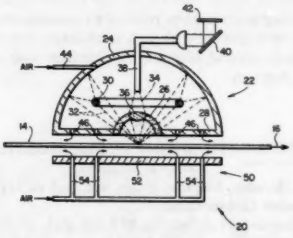
1. In a method of checking the width and parallelism of margins following the centering of a print on a support, the steps of moving the support in front of an opto-electronic

reading device in a direction parallel to the margins while illuminating said support and print, said reading device being positioned to view a margin of said support and said print by reflected light and comprising an array of photo-sensitive elements distributed in a linear manner transversely with respect to the direction of movement of said support and a camera for focusing on said array of photo-sensitive elements an image of a marginal portion of said support and said print, activating first counting means to make a first count of the number of said photo-sensitive elements of said reading device producing a signal greater than a threshold level as a first portion of said support passes said reading devices, comparing the number of said elements counted with a first reference value, subsequently making a second count of the number of said elements of said reading device producing a signal greater than said threshold level as a second portion of said support passes said reading device, comparing the number of elements counted in said second count with said reference value and comparing the difference between the number of elements counted in said first and second counts respectively with a second reference value, triggering second counting means by said first counting means, when said first counting means has counted a predetermined number of photosensitive elements producing a signal greater than said threshold level, to make a count of photosensitive elements producing signals less than said threshold level, and inhibiting said first counting means when said second counting means has counted a predetermined number of photo-sensitive elements in order to prevent a black point in the margin from being interpreted as the margin of the print.

4,277,177
APPARATUS TO MEASURE SELECT PROPERTIES OF A MOVING SHEET

Tor G. Larsen, Saratoga, and John J. Howarth, Monte Sereno, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Dec. 5, 1979, Ser. No. 100,416
Int. Cl.³ G01N *21/47*
U.S. Cl. 356—431 **6 Claims**



1. An apparatus to measure select properties of a moving sheet, said apparatus, insensitive to the flutter of said sheet, comprising:

a source to one side of said sheet capable of emitting a beam of electromagnetic radiation;

said beam aligned to impinge said sheet;

said radiation selected such that said beam is capable of being absorbed and being reflected by said sheet;

a collector to one side of said sheet capable of receiving a portion of said beam reflected from said sheet;

a detector capable of measuring said select properties of said sheet based upon said radiation received by said collector;

first means for spacing said source and said collector a constant distance from said sheet;

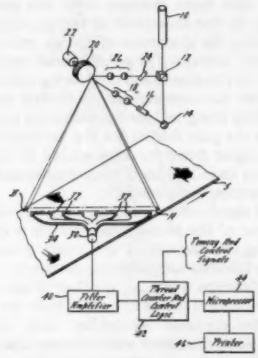
a standardization member to the side of said sheet opposite said collector; and

second means for spacing said standardization member a constant distance from said sheet, said second means including a source of fluid to direct a stream of fluid from said standardization member to impinge the moving sheet.

4,277,178
WEB ELEMENT CONCENTRATION DETECTION SYSTEM

Charles J. Cushing; Clifton W. Phillips, and Richard D. VanderNeut, all of Charlotte, N.C., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Jan. 15, 1980, Ser. No. 112,381
Int. Cl.³ G01N *21/86*
U.S. Cl. 356—431 **10 Claims**



1. A system for detecting variations in the concentration of elements in a web material comprising:

means for generating plural beams of electromagnetic radiation having a predetermined cross-sectional width;

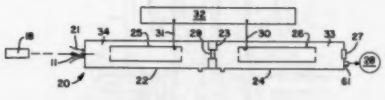
means for scanning said beams across a portion of said web material; and

means for detecting said radiation reflected from said scan portion of said web material by said elements of said web material.

4,277,179
RESONANT SUBCAVITY DIFFERENTIAL SPECTROPHONE

Charles W. Bruce, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 12, 1979, Ser. No. 19,688
Int. Cl.³ G01N *21/59*
U.S. Cl. 356—433 **1 Claim**



1. A spectrophone instrument for the in situ measurement of particulate matter and gaseous energy absorption in an atmospheric medium as an indication of pollution content and the like on a continuous basis, comprising a first and a second spectrophone assembly secured to one another along a common axial line, separated by an optical window, a light path disposed about said common axial line for the travel of a light beam from a laser source through each of said spectrophone assemblies, a first subcavity in said first spectrophone assembly and a second subcavity in said second spectrophone assembly, each of said spectrophone assemblies having an outer chamber which extends substantially beyond the subcavity axially at each end, each of said outer chambers having a window of

barium flouride placed at an angle for maximum transmission, acoustic dampening discs within each outer chamber clustered about said light path, each of said subcavities having a microphone comprising a cylindrical diaphragm of aluminized mylar axially aligned therein with spacers for sensing energy absorption means including pump means to provide an air flow path generally about said light path for the flow of said atmospheric medium including filter means encircling said optical window between said first spectrophone assembly and said second spectrophone assembly for removal of the particulate matter, so that the atmospheric medium flow includes said particulate and gaseous matter into said first spectrophone assembly and said first subcavity and gaseous matter only entering said second spectrophone assembly and said second subcavity, whereby said light beam interacts with said particulate and gaseous matter for the absorption of energy, each of said microphones sensing the absorption of energy and transmitting a signal from each subcavity to a differential input of a phase lock amplifier for combining and comparing said signals for an indication of the concentration of particulate matter in said atmosphere, there being included equalization means to effectively equalize the gain factors for the microphones, and by grouding the signal from the microphone in said first subcavity, obtaining an indication of the concentration of gaseous matter in said atmospheric medium;

wherein said equalization means includes a pre-amplifier for at least one of the microphones which is calibrated by disengaging and reattaching said pump means to parts of the first and second spectrophone assemblies located adjacent their function to modify the flow of said atmospheric medium to be from the outer ends of both the first and the second spectrophone assemblies and symmetrically through toward the center without using said filter means, and then setting the gain of the preamplifier such that the output of the phase lock amplifier is null.

4,277,180

METHOD AND APPARATUS FOR MAKING BITUMINOUS MIXTURES

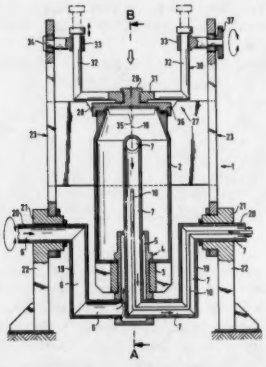
Paul Munderich, Frankfurter Strasse 84, 6466 Gruendau-Rothenbergen, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 89,767

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1978, 2848145

Int. Cl.³ B28C *5/46*

U.S. Cl. 366—7 **20 Claims**



1. A method for preparing a mixture of aggregate and a bituminous binder component, comprising the following steps: supplying a batch of moist aggregate into a pressurizable mixing container, supplying a respective quantity of the bituminous binder component into said pressurizable mixing container, starting a mixing motion of the aggregate and the bituminous binder component in the mixing container, closing the mixing container, heating the content of the mixing container to a mixture temperature and increasing the pressure in the mixing container to a value corresponding at least to the saturation pressure of the water adhering to said moist aggregate at said mixture temperature, maintaining the mixing motion and the mixture temperature at said increased pressure until the mixing is complete, and then discharging the mixture while depressurizing the mixing container.

4,277,181

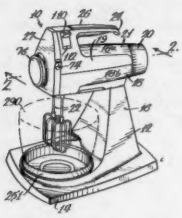
FOOD MIXER

Daniel C. Stahly, Elmhurst; William H. Scott, Lombard, and Mohamed K. Wagdy, DesPlaines, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Apr. 26, 1979, Ser. No. 33,584

Int. Cl.³ B01F *7/32, 13/00*

U.S. Cl. 366—69 **42 Claims**



1. A food mixer comprising a stand having a base with a hollow upstanding pedestal portion, a rotatable turntable seated on a peripheral thrust bearing in a rotational mounting attitude with the base, said rotatable turntable having a circular floor and an upstanding side wall adapted to engage snugly a mixing bowl removably seated therein, a mixer head supported on said pedestal for movement between a lowered operative position in which mixing elements driven by said head are received in said mixing bowl and a retracted position in which said mixing elements are raised above said bowl, a latch mounted in an upper portion of the hollow pedestal portion and including a latch lever pivotally connected to said pedestal, means cooperating with said latch lever to lock said mixer head against pivotal movement in either said retracted or operative position.

4,277,182

EXTRUDER WITH SHORT CYCLE MULTICHANNEL WAVE SCREW

George A. Kruder, Marion, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Continuation-in-part of Ser. No. 917,204, Jun. 20, 1978, Pat. No. 4,173,417, which is a continuation-in-part of Ser. No. 788,028, Apr. 15, 1977, abandoned. This application Apr. 5, 1979, Ser. No. 27,468

Claims priority, application United Kingdom, May 31, 1978, 26000/78

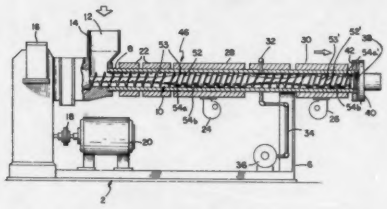
The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.

Int. Cl.³ B29B *1/06*

U.S. Cl. 366—89 **19 Claims**

1. A plasticating apparatus of the type including a rotating screw disposed within a barrel having inlet and outlet openings and cooperating with the inner wall of the barrel to convey synthetic resinous material introduced through the inlet opening through the barrel; said screw including a section comprising a helical conveying flight having an effective outer width and cooperating with the inner wall of said barrel to form a helical passage, a helical outwardly extending barrier flight disposed axially between adjacent turns of the conveying flight and dividing the helical passage into two flow channels extend-

ing side by side, each of the flow channels having a depth which varies generally cyclically through a plurality of cycles along the helical length of the flow channel, the minimum depth portions of the flow channels on opposite sides of said barrier flight defining wave crests which are displaced helically from each other, the barrier flight being undercut along its length to provide sufficient clearance between its outermost surface and the inner wall of the barrel to permit the flow thereover of the molten resinous material from an area of decreasing depth in one channel to an adjacent area of the



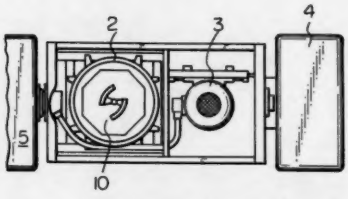
other flow channel, the effective outer width of said barrier flight being thinner than that of said conveying flight and less than eight percent of the screw pitch so that the shear energy imparted to molten material flowing over said barrier flight is low; the improvement wherein said screw section is a mixing section including at least two turns of the conveying flight, and each wave cycle having a helical length which extends less than 360 degrees about the axis of the screw whereby pumping of molten material back and forth across said barrier flight in rapid succession occurs.

4,277,183

MIXING MACHINE

Tatsuo Shinriki, Chiba, Japan, assignor to Height Inc., Chiba, Japan

Filed May 18, 1979, Ser. No. 40,392
Claims priority, application Japan, May 31, 1978, 53/65491
Int. Cl.³ B01F *7/24;* A21C *1/02*
U.S. Cl. 366—98 **8 Claims**



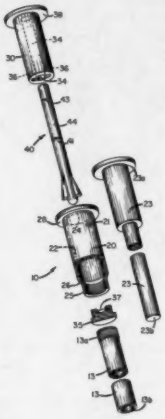
1. A mixing machine characterized by the provision of a mixing tub; a temperature regulating jacket surrounding the outer circumferential surface of said mixing tub; mixing vane members each composed of an upper portion being a leading end, the upper portion being fixed to a vertical rotary shaft and pointed in the forward direction of rotation, and a lower portion being a trailing end, the lower portion being fixed to a vertical blade member which is pointed substantially in the direction of rotation; a center plate member to which are fixed the vertical rotary shaft and the lower end of the vertical blade member; and a plurality of scraping vane members in spaced-apart relationship fixed to the outer circumferential portion of said center plate member.

4,277,184

DISPOSABLE ORTHOPEDIC IMPLEMENT AND METHOD

Alan Solomon, 16 Fox Run Rd., Dover, Mass. 02030

Filed Aug. 14, 1979, Ser. No. 66,400
Int. Cl.³ B01F *15/02, 13/06;* A61F *5/04*
U.S. Cl. 366—150 **10 Claims**



1. A disposable orthopedic implement formed of a rigid polymer and designed to mix bone cement in and dispense from a closed system comprising:

(a) a chamber having a barrel portion and a neck portion;

(b) a member reciprocable within said barrel portion of said chamber;

(c) a mixing member operatively and axially receivable within said reciprocable member; and

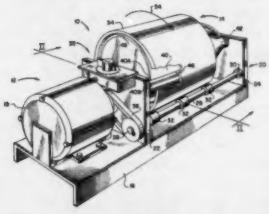
(d) means for rotating said mixing member within said barrel portion of said chamber.

4,277,185

ROTARY GRAVITY MIXER

B. Gene Thompson, 9316 Hunters Creek, Dallas, Tex. 75243

Filed Oct. 9, 1979, Ser. No. 82,687
Int. Cl.³ B01F *9/02*
U.S. Cl. 366—213 **5 Claims**



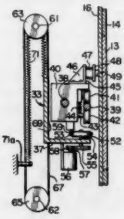
5. Apparatus for rotating a container comprising, in combination:

a cylindrical carrier having a longitudinal axis and an open end;

a clasp lodged within said carrier for holding the container in skewed relation to the longitudinal axis of said carrier, said clasp having a resilient sidewall section which is severed along its length to permit the clasp to be spread open to receive the container and to hold the container in resilient gripping engagement when released;

roller means defining a turn cradle for supporting said carrier for rotation about its longitudinal axis; and,
a drive motor coupled to said roller means.

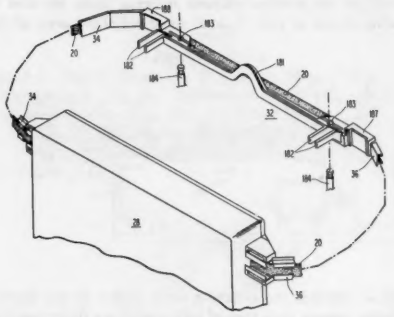
4,277,186
PRINTING AND DISPLAYING APPARATUS
Hiromichi Takahashi, Soka, Japan, assignor to Pentel Kabushikik Kaisha, Tokyo, Japan
Filed May 1, 1979, Ser. No. 35,078
Int. Cl.³ B41J *3/04*
U.S. Cl. 400—120 **4 Claims**



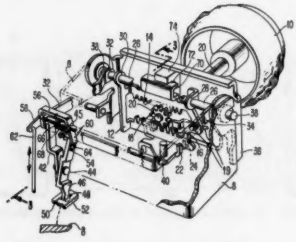
1. A printing and displaying apparatus comprising: a carriage carrying a thermal printing head; first supporting means for supporting said carriage so as to be movable in the row direction; second supporting means for supporting said first supporting means so that said carriage is movable in the column direction; a transparent platen having a surface area larger than the movable range of said carriage and disposed opposite to said printing head; feeding means for feeding a recording medium having a heat-sensitive surface between said printing head and said transparent platen such that said recording medium has its heat-sensitive surface directed toward said transparent platen; first driving means for driving said carriage in the row direction, said first driving means comprising a pair of row pulleys mounted rotatably on the opposite ends in the row direction of said first supporting means, first endless belt means trained around said row pulleys and fixed to said carriage to effect movement of said carriage in the row direction in response to movement of said first endless belt means, and a first stepping motor mounted on said first supporting means for rotatably driving one of said row pulleys to thereby effect movement of said first endless belt means; second driving means for driving said carriage in the column direction, said second driving means comprising at least one pair of column pulleys spaced apart from each other in the column direction, at least one second endless belt means trained around said column pulleys and fixed to said first supporting means to effect movement thereof in the column direction accompanied by corresponding movement of said carriage in response to movement of said second endless belt means, a second stepping motor for rotatably driving one of said column pulleys to thereby effect movement of said second endless belt means, resilient means for biasing said second supporting means toward one end position in the column direction, and ratchet means for releasably holding said second supporting means in any desired position against the biasing force of said resilient means; and control means for controlling said first and second stepping motors and said feeding means to enable printing of desired characters on said recording medium.

4,277,187
RIBBON LOCATING MEANS
Michael J. Rello, Willow Grove, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.
Filed Jul. 27, 1979, Ser. No. 61,454
Int. Cl.³ B41J *35/04, 32/00*
U.S. Cl. 400—248 **15 Claims**

1. In a ribbon supply assembly for supply of ribbon to a point of action comprising a housing for containing ribbon having opposing faces, ribbon locating means for supporting said ribbon while in the vicinity of said point of action and leader means connecting said locating means with said housing and for conveying ribbon therebetween, the improvement in said locating means comprising end portions adapted to detechably mate with mounting means, said end portions being formed of a resilient material and having finger-contacting means extending outwardly away from said ribbon faces on one side thereof and regions of flexure formed therein, whereby upon application of pressure to said finger-contacting means in a direction substantially parallel with the direction of ribbon conveyance through said locating means said end portions are resiliently flexed about said regions of flexure, permitting said end portions to be detached from said mounting means.



4,277,188
DIRECT KEYBOARD CONTROLLED RACK SHIFT DEVICE FOR A SINGLE ELEMENT TYPEWRITER
Robert F. McDaniel, Paris, Ky.; Mike Prewarski, El Paso, Tex., and Leonard D. Ramey, Versailles, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 5, 1979, Ser. No. 54,760
Int. Cl.³ B41J *25/24*
U.S. Cl. 400—257 **4 Claims**

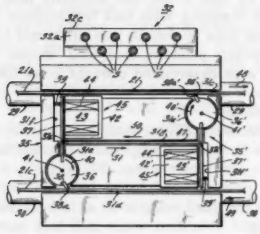


1. A typewriter comprising a platen, a selectable print element, means for rotating said selectable print element, means for controlling the direction of rotation of said print element, a keyboard comprising operator controlled means connected to said means for controlling the direction of rotation, said connection between said operator controlled means and said means for controlling the direction of rotation further comprising a force multiplying, displacement dividing means for converting an output of said operator control means into a mechanical displacement for operating said means for controlling the direction of rotation.

4,277,189
BIDIRECTIONAL CARRIAGE DRIVE EMPLOYING A CLOSED LOOP BELT DRIVE MEANS FOR PRINTERS AND THE LIKE

Robert Howard, Windham; Prentice Robinson, and Alexander F. Vitale, both of Pelham, all of N.H., assignors to Centronics Data Computer Corp., Hudson, N.H.

Continuation of Ser. No. 692,484, Jun. 3, 1976, abandoned. This application Apr. 9, 1979, Ser. No. 28,318
Int. Cl.³ B41J *19/00*
U.S. Cl. 400—320 18 Claims

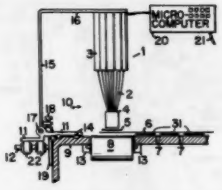


1. Driving means for printers and the like comprising:
rotatably mounted drive and idler pulleys;
a closed loop belt entrained about said pulleys and defining first and second belt runs;
means for rotating said drive pulley and said belt;
a carriage assembly and means for slidably guiding said carriage assembly along a path arranged substantially parallel to at least one of said first and second belt runs;
said carriage assembly including first and second guideway passages for receiving said first and second belt runs, respectively;
first movable means pivotally mounted in said carriage assembly and including first wedge means movable into said first guideway passage for engaging and gripping said first belt run, said first wedge means being pivotally mounted to increase the wedging action as said first wedge means pivots, whereby the movement of said first belt run contributes to said wedging action;
second movable means pivotally mounted in said carriage assembly and including second wedge means movable into said second guideway passage for engaging and gripping said second belt run, said second wedge means being pivotally mounted to increase the wedging action as said second wedge means pivots, whereby the movement of said second belt run contributes to said wedging action;
means for normally biasing said first and second movable means to pivot in a direction to simultaneously move both said first and second wedge means away from said first and second guideway passages and out of engagement with said first and second belt runs;
first and second control means for urging said first and second movable means against the force of said biasing means and for moving one of said first and second wedge means in the direction of movement of an associated first and second belt run and into wedging engagement with said associated belt run whereby said carriage assembly is driven in a direction determined by the run of the belt engaged by said first or second wedge means.

4,277,190
INDICIA PRINTER

Michael W. Rudy, Thousand Oaks; Thomas D. Horning, Sepulveda, and Edward J. Kraemer, Canoga Park, all of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

Filed Aug. 21, 1979, Ser. No. 68,857
Int. Cl.³ B41J *11/42*; G03B *27/52*
U.S. Cl. 400—582 18 Claims



2. A programmable printer for printing upon moving documents prior to sequentially photographing said documents (6), comprising;
(a) transport means (31) to translate a first document rapidly for manipulation related to photographing, and to hold it stationary for photographing,
(b) logic means (44) to control said transport means, to reduce the rapidity of translation for a second document while said printing is occurring thereon,
(c) a stationary character-synthesizing printer (1), having elements (2) aligned transversely of the direction of motion of said documents,
(d) means to selectively electrically actuate (3,64,65) said elements, to linearly print characters upon said second document while it is slowly translating, and
(e) a programmable microcomputer (20) having a character lookup table (53), a time window circuit (50) and an input control circuit (51) to successively selectively synthesize the characters for the printer,
said microcomputer electrically connected to said printer and also to said logic means (44) and document actuated transport sensors
to synchronize the actuation of the printer with the movement and manipulation of said first and second documents, through said time window circuit and said input control circuit
for inhibiting printing upon said second document while photographing said first document.

4,277,191
PRINTER SYSTEM HAVING MICROPROCESSOR CONTROL

Glenn W. Davis, Endicott, N.Y., and Arthur E. Fleek, Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

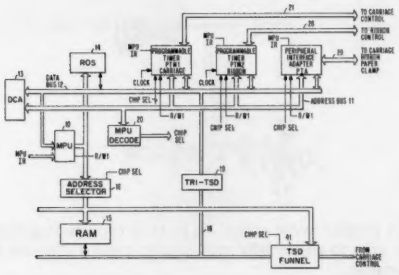
Filed Jan. 28, 1980, Ser. No. 115,850
Int. Cl.³ B41J *11/42*
U.S. Cl. 400—582 10 Claims

1. In a printer system having a print mechanism comprising a plurality of non-printing units including a carriage drive for feeding a print medium in increments of one or more line spaces having a drive means and an emitter associated with said drive means for generating feedback pulses during operation of said drive means,
a control system for operating said carriage drive comprising in combination,
control means comprising a programmable interface to said drive means,
said interface including a control adapter programmable for generating various control signals to said drive means and

timing means programmable for timing various operations of said drive means for feeding said print medium,

said adapter and said timing means being operable for generating processor interrupt signals associated with said timing operations and said feedback pulses,

a microprocessor for programmably controlling said drive means through said adapter and said timing means in response to said interrupt signals from said timing means and said feedback pulses,



said microprocessor being responsive to other interrupt signals from other devices in said printer system during operation of said drive means including interrupt signals capable of preempting said microprocessor from control of said drive means,

and means for preventing the loss of control of said drive means by said microprocessor resulting from interrupt signals from said other devices.

4,277,192

END OF LINE LOCKING MECHANISM FOR POWER OPERATED TYPEWRITER

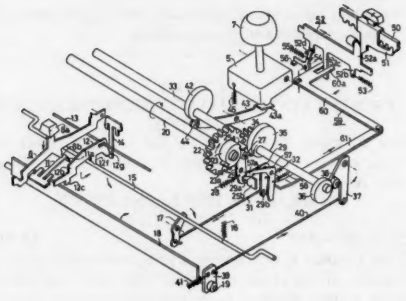
Toshio Nakai, Nagoya; Susumu Kuzuya, Gifu; Hiroshi Onoda, Kariya; Takayuki Iwase, Chiryu, and Akira Asai, Nagoya, all of Japan, assignors to Brother Industires, Ltd., Nagoya, Japan

Filed Jan. 8, 1979, Ser. No. 1,587

Claims priority, application Japan, Feb. 1, 1978, 53-10729

Int. Cl.³ B41J *29/54*

U.S. Cl. 400—671 **9 Claims**



1. In a power operated typewriter having a frame, a driving motor, a keyboard, a printing mechanism operated upon depression of each key of the keyboard, an escapement mechanism actuated upon operation of the printing mechanism, a carriage which is moved step by step in a letter feed direction by the escapement mechanism;

a right-hand margin line lock mechanism, comprising in combination:

(a) a clutch (23) disposed between the motor and the printing mechanism;

(b) a control lever (25) normally held in a first position for keeping said clutch (23) in a disengaged condition;

(c) control means for moving said control lever from the first position to a second position allowing said clutch to come into an engaged condition in order to operate said printing mechanism upon depression of each key;

(d) a cam member (35) rotated upon engagement of said clutch for temporarily bringing said control lever from the second position to a third position passing over the first position for allowing said printing mechanism to come into a disengaged condition;

(e) first and second stoppers (51, 52) for defining a last printing position of a printing line, said first stopper supported by the carriage and said second stopper movably supported by said frame and normally held in an original position engaging with said first stopper when said carriage has been moved to a position one letter before the last printing position, and said second stopper being moved a predetermined distance from the original position when said carriage has been moved to the last printing position;

(f) a lock member (57) movably supported by the frame so as to move between an inoperative position and an operative position, said lock member (57) normally held in the inoperative position, and being lockable with said control lever in the third position so as to hold said clutch in the disengaged condition when said lock member moves to the operative position; and,

(g) an actuating member (59) normally held in an original position and actuated by the second stopper so as to move said lock member to the operative position when said second stopper moves the predetermined distance, whereby, said lock member in the operative position locks said control lever when said control lever has been brought to the third position by said cam member upon the printing operation of said printing mechanism at the last printing position.

4,277,193

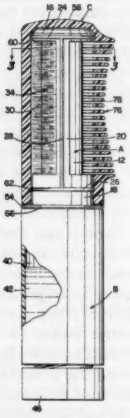
HAIR GROOMING DEVICE

Ray Knaus, 5565 Wilson Dr., Mentor, Ohio 44060

Continuation-in-part of Ser. No. 876,936, Feb. 10, 1978, abandoned. This application Jul. 18, 1979, Ser. No. 58,627

Int. Cl.³ A46B *11/00, 15/00*

U.S. Cl. 401—39 **12 Claims**



1. A brush including a handle having a brush head extending therefrom, bristles extending outwardly from said head, reser-

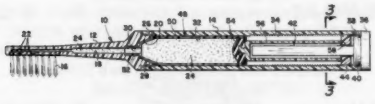
voir means on said handle for a liquid treating agent, passage means from said reservoir means to said bristles for supplying a liquid treating agent to said bristles, a rotatable cover member surrounding said head and having a lateral opening therein, said cover member being rotatable between a bristle exposed position and a bristle storage position, said lateral opening being aligned with said bristles in said bristle exposed position of said cover member, said bristles being out of alignment with said lateral opening and being completely concealed within said cover member in said bristle storage position of said cover member, comb teeth integral with said cover member and spanning said lateral opening generally circumferentially of the longitudinal rotational axis of said cover member, said teeth being spaced outwardly from said brush head to define a space between said teeth and head which is occupied by said bristles in said bristle exposed position of said cover member so that hair is subjected to combined combing and brushing action in said bristle exposed position of said cover member, and said teeth being spaced outwardly from said brush head in said bristle storage position of said cover member to define a free space between said teeth and head which is unoccupied by bristles so that hair is subjected only to combing action by passage of hair through said teeth and through said free space.

4,277,194

PASTE DISPENSING TOOTHBRUSH

Donald R. Smith, 1601 W. Knoxville, Broken Arrow, Okla. 74012

Filed Sep. 20, 1979, Ser. No. 77,342
Int. Cl.³ B46B *11/02*
U.S. Cl. 401—173 **5 Claims**



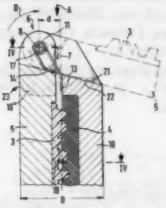
1. A paste feed toothbrush comprising an elongated shank member having bristles and a passageway extending from one end of the shank member into open communication with the bristles, an elongated hollow cylindrical handle member having the first end securable to the shank member, a paste compartment in the handle member in communication with the shank passageway when the handle is secured to the shank, a piston member slidably carried in the paste compartment, an elongated hollow piston rod carried by the piston and extending toward the second end of the handle member, a drive knob member rotatably carried by the second end of the handle member, an elongated rotary drive rod secured to the drive knob and having a polygonal shaped cross-section and extending toward the first end of the handle, said rod being loosely receivable within the hollow piston rod, a rotary drive disc having a polygonal shaped aperture therein for slidably receiving the drive rod therethrough and for rotating with said drive rod, said drive disc being threadably disposed within the handle member and engageable with the outer end of the piston rod whereby upon rotation of the drive knob and associated drive rod, the drive disc threadably moves along the interior of the handle toward the first end thereof thereby pushing the piston through the paste compartment forcing the paste into communication with the bristles.

4,277,195

WRITING UTENSIL WITH BUILT-IN STAMP AND STAMP PAD

Winfried Huslik, Oberstdorfer Str. 4 1/2, Augsburg, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,353
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827530
Int. Cl.³ B43K *29/00*
U.S. Cl. 401—195 **14 Claims**



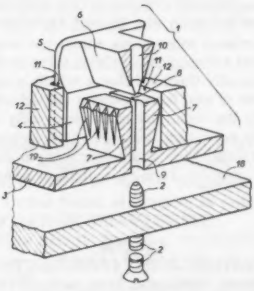
1. In a writing utensil with a built-up stamp and stamp pad where a support on which the stamp is mounted can be swiveled around a swivel axis which is located on the end of the utensil opposite the writing end and transverse to the longitudinal axis of the utensil, said swiveling occurring between a retracted position which essentially is parallel with the longitudinal axis and in which the stamp is in contact with the stamp pad, and a swing-out position, the improvement comprising the swivel being formed by the end of a non-swiveling portion of the writing utensil, the stamp pad being arranged on the non-swiveling portion of the writing utensil adjacent the swivel, and the support with the stamp on its inside being pivotal by at least 180°.

4,277,196

FIXING DEVICE FOR SECURING ANY PART TO A HOLDING MEMBER SUCH AS A PANEL BY INSERTING SAID FIXING DEVICE INTO A HOLE OF STANDARD SHAPE FORMED IN SAID PANEL

Henri Morel, Maule, France, assignor to ITW de France, Beauchamp, France

Filed Nov. 21, 1979, Ser. No. 96,592
Claims priority, application France, Nov. 30, 1978, 78 33799
Int. Cl.³ F16B *2/14*
U.S. Cl. 403—3 **6 Claims**



3. A one piece plastic fastener adapted to be secured in a complimentary apertured support including a head having a central bore therethrough, and engaging and overlying said apertured support, two leg means extending integrally from said head and separated by slot means including a continuation of said bore, rectilinear wedge means initially positioned in line

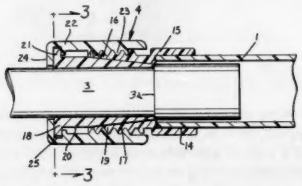
with but remote from said slot means at a position remote from said head, deformable means integrally interconnecting said wedge means to said head, actuation means extending through said head bore and said slot means to engage said wedge means and facilitate movement of said wedge means into said slot means by bending said deformable means and thereby spread said leg means into engagement with the walls of said support aperture.

4,277,197

TELESCOPING TOOL AND COUPLING MEANS THEREFOR

Allen H. Bingham, Lithonia, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed Jan. 14, 1980, Ser. No. 111,658
Int. Cl.³ F16B 7/10
U.S. Cl. 403—104 **2 Claims**



1. A coupling for frictionally connecting a pair of telescopically related tubes said coupling comprising an externally threaded sleeve secured to and forming an extension of one end of the outer one of said telescopically related tubes and having an outwardly tapered interior surface of the configuration of a truncated cone, a tubular wedge disposed about the inner one of said telescopically related tubes and within a part of said sleeve, said wedge having an outer surface at least a part of which is tapered and of complementary configuration to said interior surface of said sleeve and having an outwardly projecting coupling element, an internally threaded cap sleeve in threaded engagement with said sleeve and having a part in engagement with one end of said wedge for urging said wedge into tight frictional contact between the inner one of said telescopically related tubes and said sleeve so as effectively to interlock said telescopically related tubes in coordination with tightening of said cap sleeve, a recess formed in said cap sleeve and receiving said outwardly projecting coupling element whereby said wedge is moved out of tight frictional contact with said sleeve and with the inner one of said telescopically related tubes in coordination with loosening of said cap sleeve, and a closure cap secured to the outer one of said telescopically related tubes at the other end thereof, the inner one of said telescopically related tubes being somewhat longer than the outer one of said telescopically related tubes so that the inner end of the externally threaded sleeve which is secured to the inner longer one of said telescopically related tubes is spaced somewhat from the outer end of the internally threaded cap sleeve which is associated with the outer larger one of said telescopically related tubes so as to prevent pinching the finger or hand of the operator during a collapsing operation of said tubes.

4,277,198

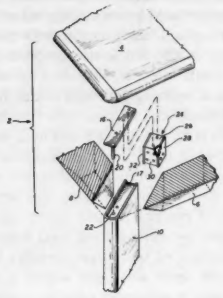
FURNITURE JOINT CONSTRUCTION

Robert P. Beckman, Burlington, Iowa, assignor to Litton Business Systems, Inc., Burlington, Iowa

Filed Jun. 7, 1979, Ser. No. 46,265
Int. Cl.³ F16B 12/46; F16D 1/00; F16M 11/16
U.S. Cl. 403—231 **10 Claims**

1. In an article of furniture comprising a table, desk, or the like, a furniture joint construction comprising a plurality of furniture members of said article of furniture adapted to be secured together and brace means for securing said members together:

said brace means comprising a base member and a plurality of plate-like members secured to and extending away from said base member;



said base member and said plate-like members each respectively being secured to a different one of said furniture members;

dowel means extending into one of said furniture members; and

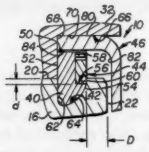
a plate securing said brace means and said dowel means together, with said dowel means mounted to said plate.

4,277,199

KEEPER ASSEMBLY

Richard E. Livesay, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00187, § 371 Date Mar. 23, 1979, § 102(e) Date Mar. 23, 1979, PCT Pub. No. WO80/02059, PCT Pub. Date Oct. 2, 1980
This PCT application filed Mar. 23, 1979, Ser. No. 83,998
Int. Cl.³ F16B 21/16
U.S. Cl. 403—317 **8 Claims**



1. In a keeper assembly (**10**) of the type including a first member (**16**) having a central axis (**18**) and an annular groove (**42**) opening on an outer cylindrical surface (**20**), and a second member (**32**) having a force transmitting surface (**68**), the improvement comprising:

a plurality of arcuate keeper segments (**40**) positionable in the groove (**42**) and being of a construction sufficient for transferring force from the force transmitting surface (**68**) of the second member (**32**) into the first member (**16**), each segment (**40**) having an axially outwardly opening side seat (**56**) having an axially outwardly facing surface (**58**) and an arcuate radially outwardly facing uninterrupted cylindrical surface (**60**); and

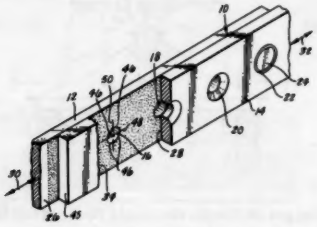
retaining means (**44**) releasably connected to the side seats (**56**) for holding the arcuate keeper segments (**40**) positively in the groove (**42**), the side seats (**56**) being of a construction sufficient for substantially solely axially receiving the retaining means (**44**).

4,277,200

STRUCTURE TO RETARD FRETTING AND METHOD OF MANUFACTURE

Eugene R. Speakman, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 13, 1979, Ser. No. 75,520
Int. Cl.[3] B25G *3/00*; F16D *1/00*; F16G *11/00*; B25G *3/36*
U.S. Cl. 403—408 7 Claims



1. A structure constructed to reduce fretting fatigue including:

a first member being a shim having first and second opposite surfaces thereon, said first surface having a tetrafluoroethylene coating thereon;

a second member having a first surface thereon in contact with said tetrafluoroethylene coating of said first surface of said first member;

a third member having a first surface which faces toward said first surface of said second member and is held in contact with said second surface of said first member; and

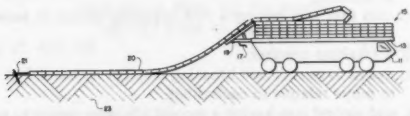
fastener means to hold said first, second, and third members in contact whereby loads are transmitted between said first and third members with reduced fretting levels at said first surfaces thereof.

4,277,201

TRANSPORTABLE ROADWAY AND MEANS FOR DEPLOYING THE SAME

William R. Abell, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 25, 1980, Ser. No. 115,311
Int. Cl.[3] E01C *9/08*, *19/52*
U.S. Cl. 404—35 11 Claims



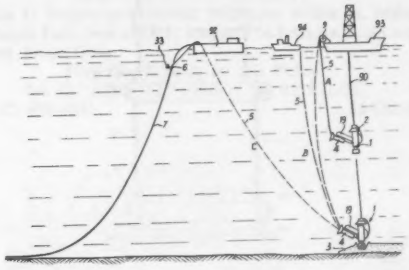
1. A transportable roadway comprising an articulated array of planks arranged edge to edge with the length of each plank comprising the width of the deployed roadway, each plank having a tongue on one edge thereof and a mating groove on the other edge thereof, said roadway comprising a plurality of sections, each section comprising a plurality of said edge to edge planks, each of said planks being attached or bonded on one broad side thereof to a flexible fabric or membrane with the tongues and grooves of each plank engaging the tongues and grooves of adjacent planks, adjacent sections of said roadway being connected to each other by means of hinges connecting the planks at each end of said sections to the corresponding planks at the end of each adjoining section, said hinges being on the side of said planks opposite from said flexible fabric, whereby said roadway may be folded layer upon layer on the bed of a transporter/launcher vehicle having a bed length equal to approximately one half of the length of each section of said roadway and whereby said roadway may be quickly and easily deployed either from the rear of said vehicle or from the front thereof over the cab of said vehicle.

4,277,202

POSITIONING OF THE END OF AN UNDERWATER FLOWLINE

Denis G. Archambaud, Paris, and Rene M. Dermy, Evry, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed May 2, 1979, Ser. No. 35,179
Claims priority, application France, May 12, 1978, 78 14242
Int. Cl.[3] E21B *43/01*; F16L *1/00*
U.S. Cl. 405—169 29 Claims



1. A process for positioning and locking the end of an underwater flow line bundle in a predetermined site on a seabed base, comprising the steps of:

(a) connecting one end of a hauling cable to the end of the flow line bundle,

(b) guiding the other end of the cable through a connecting sheath freely pivotally mounted in both azimuth and elevation to an apparatus releasably mounted on said base, and around a pulley mounted on said apparatus and freely pivotable in azimuth,

(c) drawing said other end of the cable toward the water surface to draw said end of the flow line bundle into the sheath, said sheath pivotally assuming an orientation during said drawing to minimize the bending deformation of the flow line bundle,

(d) locking the end of the bundle in the sheath,

(e) displacing said sheath into said site, and

(f) locking said sheath to the base at said site.

4,277,203

SOIL STABILIZATION MATERIALS AND METHODS

Russell Reed, Jr., Ridgecrest, Calif.; Kenneth L. Moore, Silver Springs, Md., and Gary W. Meyers, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

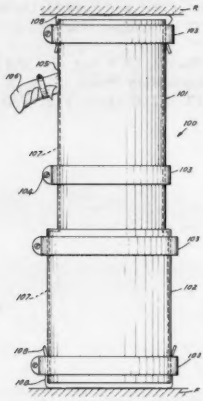
Filed Apr. 10, 1980, Ser. No. 139,077
Int. Cl.[3] E02D *3/12*
U.S. Cl. 405—264 5 Claims

1. In a method for stabilizing soil wherein a liquid is applied to the soil surface and allowed to polymerize to form an elastomeric resin which bonds the soil particles together to form a composite structure the improvement residing in utilizing as said liquid a mixture of dimer diisocyanate and a derivative of dimer diamine wherein the amine groups have been reacted with a ketone to form ketimine groups.

4,277,204
EXCAVATION ROOF SUPPORT AND METHOD OF INSTALLING THE SAME

Manfred Koppers, Duisburg; Karlheinz Bohnes, Bochum, both of Fed. Rep. of Germany, and Harry J. Fitzgerald, Pittsburgh, Pa., assignors to Bochumer Eisenhütte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Sep. 13, 1979, Ser. No. 74,998
Int. Cl.[3] E21D *15/00*
U.S. Cl. 405—288 16 Claims



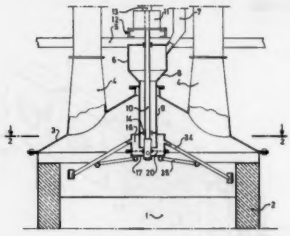
1. A method of supporting an overburden, particularly a roof of an underground excavation such as a mine, comprising the steps of providing a hollow tubular prop casing having at least one section of self-supporting sheet material and which is circumferentially incomplete and has a longitudinally extending slit; overlapping marginal portions of said sheet material which bound said slit, to an extent requisite for obtaining a desired diameter of said section; arresting the overlapped portions in their overlapped condition; erecting the prop casing; installing in the prop casing a fabric bag extending lengthwise of the casing; and filling the fabric bag with a hardenable substance in flowable condition so that under the influence of the entering substance and shaped by the casing, the bag and its contents form a column which, upon hardening of the substance, is by itself able to support the roof.

4,277,205
APPARATUS FOR DISTRIBUTION OF SOLID PARTICLES

Georges Meunier, Fontaines par Chagny, France, assignor to Saint Gobain Industries, Neuilly-sur-Seine, France

Filed Jun. 19, 1979, Ser. No. 50,053
Claims priority, application France, Jun. 19, 1978, 78 18291
Int. Cl.[3] B65G *53/18*
U.S. Cl. 406—123 28 Claims

1. An apparatus for distributing solid particulate matter which comprises a generally vertical tubular conduit for receiving the particulate matter, rotary particulate matter distributing means positioned at the lower portion of said generally vertical tubular conduit and having a vat, said vat being open at the top and having at least one fluidization grate positioned in its lower portion, said generally vertical tubular conduit opening into said vat at a location above said fluidization grate so as to permit directing the particulate matter onto said fluidization grate, gas feed conduit means positioned generally coaxially of said rotary distributing means and opening at a location under said at least one fluidization grate to fluidize the particulate matter directed to said fluidization grate, and a plurality of distribution conduits connected to upper peripheral portions of said vat, each of said distribution conduits being connected thereto at substantially the same height, said generally vertical tubular conduit opening into said vat at a location below the locations of connection of said distribution conduits to said vat to thereby permit formation of a fluidized bed of said particulate matter above the level of the lower opening of said generally vertical tubular conduit thereby

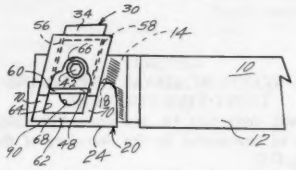


preventing gas exchanges above said fluidized bed between the atmospheres inside and outside of said generally vertical tubular conduit, said distribution conduits extending generally radially outwardly from said vat and being adapted to receive and distribute particulate matter overflowing from said fluidization grate as said rotary distributing means rotates.

4,277,206
ADJUSTABLE CHIP BREAKER FOR A CUTTING TOOL

Edward W. Hilton, 830 N., Centralia, Wash. 98531

Filed Nov. 29, 1979, Ser. No. 98,674
Int. Cl.[3] B23B *27/22*
U.S. Cl. 407—3 8 Claims



1. A chip breaker for a cutting tool, said chip breaker comprising;
   a. a yoke having a base, a first arm and a second arm;
   b. in an end view said yoke presenting the configuration of a U-member;
   c. said first arm having a first adjusting means to assist in positioning said yoke;
   d. a breaking member;
   e. means to permit said breaking member and said first arm to move relative to each other;
   f. said second arm having a second adjusting means to assist in positioning said yoke.

5. A combination of a cutting tool and a chip breaker:
   a. said cutting tool comprising:
      1. a shank;
      2. a head portion; and,
      3. a cutting bit positioned on said head portion;
   b. said chip breaker comprising:
      4. a yoke having a base, a first arm and a second arm;
      5. in an end view said yoke presenting the configuration of a U-member;
      6. said first arm having a first adjusting means to assist in positioning said yoke on said cutting tool juxtapositioned to said cutting bit;
      7. a breaking member;
      8. means to permit said breaking member and said first arm to move relative to each other;

9. said second arm having a second adjusting means to assist in positioning said yoke on second cutting tool.

4,277,207

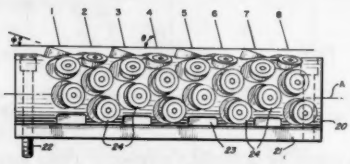
HELICAL BROACHING TOOL FOR CURVED SURFACES

Sylvester E. Proulx, Windsor, Canada, assignor to J.P. Tool Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 867,292, Jan. 5, 1978. This application May 18, 1979, Ser. No. 40,377

Int. Cl.³ B26D *1/12*

U.S. Cl. 407—15 **14 Claims**



1. A broaching tool comprising an elongated tool body having an arcuate face of at least 45°, a plurality of recesses formed in said arcuate face, each said recess having a flat bottom face inclined inwardly and rearwardly within 1°–15° of coincidence with the longitudinal axis of the body and an arcuate abutment wall perpendicular to and rearwardly surrounding said flat bottom face, said recesses being arranged in a helical path of generally increasing diameter in a rearward direction about said tool body arcuate face from the front end of said body to the rear end thereof to form a series of spaced helical rows with the recesses of each row being staggered circumferentially with respect to the recesses of the next adjacent row whereby the paths of successive recesses partially overlap, cylindrical cutter discs mounted in said recesses whereby the plane of said cutter discs lies parallel to the flat bottom face of said recesses, each disc having an end face providing a cutting edge disposed about the periphery of the end face and being rotatably indexable about its longitudinal axis to bring successive cutting portions into cutting position and said helical paths arranged such that the spacing between adjacent recesses within said helical paths is less than the spacing between adjacent helical paths.

4,277,208

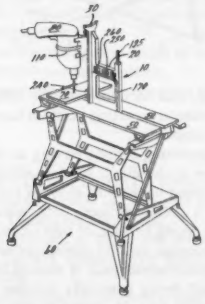
TOOL GUIDE

Ronald A. Jackson, Brockville, and John Maruscak, Athens, both of Canada, assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 6, 1979, Ser. No. 64,016

Int. Cl.³ B23B *45/14, 49/00*

U.S. Cl. 408—14 **12 Claims**



1. In a tool guide for supporting a portable power tool having a longitudinal slideway and a tool holder slidably engaged with slideway for securing a portable power tool to said tool guide; the improvement comprising a depth stop slidably engageable with said slideway and comprising first and second flexible leg portions having formed at the free-ends thereof a plurality of teeth adapted to engage complementary teeth formed along said slideway and disengagement means connected to said first and second leg portions for disengaging the teeth on said leg portions from the teeth in said slideway, said first and second leg portions projecting inwardly toward each other in a first longitudinal direction relative to said slideway such that said depth stop can be moved along said slideway in said first direction without utilizing said disengagement means but cannot be moved in the opposite direction along said slideway without utilizing said disengagement means.

4,277,209

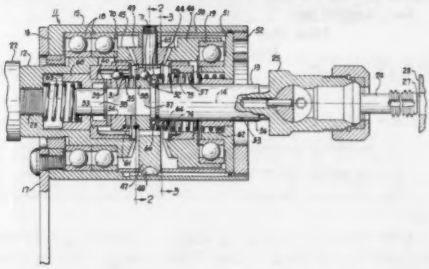
THREADING ATTACHMENT

Milton L. Benjamin, Moreland Hills, and Wilbur N. Miles, Chagrin Falls, both of Ohio, assignors to Erickson Tool Company, Solon, Ohio

Filed Dec. 3, 1979, Ser. No. 99,936

Int. Cl.³ B23Q *5/22*; F16D *11/04*; B21K *1/56*

U.S. Cl. 408—139 **12 Claims**



1. A threading attachment, comprising in combination,

an outer case,

input and output members coaxially journalled relative to each other in said case,

a clutch having drive and driven clutch elements and connected between said input and output members,

one of said clutch elements having a plurality of substantially axially parallel abutment shoulders,

the other of said clutch elements having substantially hemispherical non-rotating lateral projections adapted to rotationally engage said shoulders for a dog clutch engaged condition,

said clutch elements being relatively longitudinally movable apart to establish a clutch disengaged condition, and

spring means relatively urging said clutch elements longitudinally toward engagement, whereby a threading tool rotated by said output member will thread a workpiece until the clutch is disengaged.

4,277,210

ADJUSTABLE ANGLE STAR FEED MACHINING SLIDE

John T. Murray, San Jose, Calif., assignor to United Centrifugal Pumps, San Jose, Calif.

Filed Oct. 12, 1979, Ser. No. 84,090

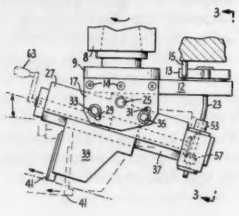
Int. Cl.³ B23C *3/02*; B23B *3/00, 51/00*

U.S. Cl. 409—191 **2 Claims**

1. In a metal cutting machine, said machine having a rotating spindle supporting a tool holding slide wherein a star wheel contacts a trip pin on said machine tool on each rotation of said spindle and advances a cutting tool along said slide, the improvement comprising:

a. a pair of downwardly extending parallel spaced plates attached to said spindle,

b. a slide assembly, mounted between said plates, said slide assembly being pivitably mounted on said plates,



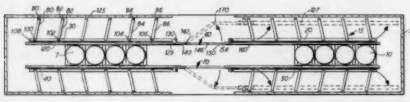
c. a plurality of arcuate slots in said plates with machine screws extending through said slots and into said slots whereby said machine screws can be tightened to hold said slide assembly at a desired angle.

4,277,211

MANUALLY OPERATED ADJUSTABLE RETAINER

James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed May 3, 1979, Ser. No. 35,701
Int. Cl.³ B61D *45/00*
U.S. Cl. 410—47 **10 Claims**



4. A retaining mechanism suited to simultaneously retain cargo of two different widths within a cargo carrying vehicle comprising:

a first, second, third and fourth means for retaining;

a first and a second means for linking;

each of said means for retaining includes a plurality of elongated retaining members each member of which has a first and a second end, and an elongated connecting member with a means for locking affixed thereto;

each said retaining member is pivotably connected at a said first end to said elongated connecting member, and

said second end of each said retaining member is pivotably attachable to a selected surface of the cargo carrying vehicle such that each of said retaining members is oriented parallel to each of said other retaining member whereby said elongated connecting member may be moved laterally with respect to the cargo;

each of said first, second, third and fourth means for retaining is affixable to a selected surface of the cargo vehicle by pivotably attaching each of said second ends to said members of said plurality to the selected surface of the cargo vehicle with said first and second means for retaining being positioned adjacent one another on a first side of the cargo and said third and fourth means for retaining being positioned adjacent one another on a second side of the cargo;

first and second linking means each having a first and a second end with a first and a second pivot point spaced therebetween such that said first and said second ends of said first linking means are receivable by said elongated connecting member of said first and second means for retaining and lockable thereto; and,

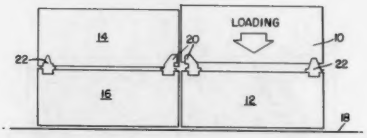
said first and said second ends of said second linking means are receivable by said elongated connecting member of said third and fourth means for retaining and lockable thereto.

4,277,212

CONNECTOR INTERCONNECTING FREIGHT DEVICES

Albert H. Rosaia, North Patchogue, N.Y., assignor to Peck & Hale, Inc., West Sayville, N.Y.

Filed Mar. 16, 1979, Ser. No. 21,424
Int. Cl.³ B65D *21/02, 25/20;* B65J *1/22*
U.S. Cl. 410—78 **29 Claims**



1. A connector to secure a member to a base support disposed vertically therebelow, said member having at least one web portion defining an opening which communicates with an inner recess, comprising:

(a) a base;

(b) a post extending from said base and being dimensioned and configured for removable entry into said opening;

(c) means carried by said post to provide vertical restraint to said when said post is positioned to extend into the opening of the web portion and the member is restrained from movement in at least one horizontal direction, and for removal of said vertical restraint when said horizontal restraint is eliminated; and

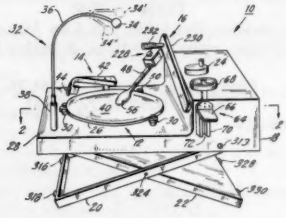
(d) means on said base for attaching said base to said base support.

4,277,213

SELF-FEEDING DEVICE FOR HANDICAPPED PERSONS

William H. Morewood, Pennington, N.J., assignor to Winsford Products, Inc., Pennington, N.J.

Filed Jul. 18, 1979, Ser. No. 58,724
Int. Cl.³ A47G *21/08*
U.S. Cl. 414—9 **21 Claims**



1. A self-feeding device for automatically lifting food off the eating surface of a plate to an eating position located above said plate, said device comprising:

(A) means for supporting a plate having an eating surface;

(B) pusher means including a food pushing surface, said pusher means being capable of moving said food pushing surface along a predetermined path which traverses a portion of said eating surface of said plate in such a manner that food located on said eating surface of said plate along said predetermined path is moved by said pushing surface, said path being generally arcuate as viewed in a first plane parallel to said eating surface and generally polygonal as viewed in a second plane orthogonal to said first plane;

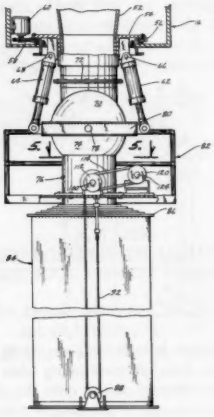
(C) spoon support means capable of moving a spoon between a lower position in which food moved by said pushing surface is moved onto said spoon and an upper position in which food moved on said spoon by said pushing surface is located at said eating position; and

(D) human actuable control means operable in a first mode wherein said control means causes said pusher means to move said pusher surface along said predetermined path such that food located on eating surface is moved on to said spoon and causes said spoon support means to move said spoon from said lower to said upper position after said food is moved on to said spoon responsive to the selective actuation of said control means by an operator of said self-feeding device.

4,277,214
BARGE LOADING DEVICE

Howard C. Mahle, Minnetonka, and Kenneth L. Wesenberg, Roseville, both of Minn., assignors to Nott Company, Minneapolis, Minn.

Filed Dec. 11, 1979, Ser. No. 102,404
Int. Cl.³ B65G *67/60*
U.S. Cl. 414—139 **12 Claims**



1. A barge loading device comprising,

a support tower,

a boom means rotatably mounted on said support tower, about a vertical axis, and extending outwardly therefrom,

a vertically disposed spout extending downwardly from the outer end of said boom means,

conveyor means on said support tower and said boom means for conveying material to the upper end of said spout,

first means for rotatably moving said boom means relative to said support tower,

second means for tilting said spout to either side of its normally disposed vertical position,

and third means for rotating said spout about its longitudinal axis.

4,277,215
ARTICULATE MATERIAL TRANSFER SYSTEM

Weldon K. Johnson, Boise, Id., assignor to Kerr-McGee Coal Corporation, Oklahoma City, Okla.

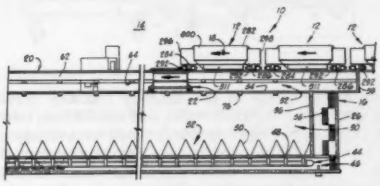
Filed Oct. 4, 1979, Ser. No. 81,887
Int. Cl.³ B65G *65/32*; B61D *7/30*
U.S. Cl. 414—292 **39 Claims**

1. An unloading system for transferring particulate material from a moving vehicle having a storage bin to an underground storage assembly while substantially protecting the particulate material from the surrounding outside environment, said apparatus comprising:

an underground storage assembly having at least a first chamber and an upper second chamber, the first and upper second chambers being separated by a first partition wall, the first partition wall having at least one opening therein providing communication between the first and upper second chambers;

sealing means operatively disposed in the opening of the partition wall, the sealing means having a closed first position to substantially close the opening in the partition wall and an open second position to allow communication between the upper second chamber and the first chamber;

traversing means having a flow channel therein, the traversing means being movably disposed within the upper second chamber, the traversing means being operatively engagable with the vehicle to establish communication between the vehicle storage bin and the flow channel, and



the traversing means being operatively engagable with portions of the sealing means to position the sealing means in the open second position to establish communication between the first chamber and the flow channel, and the traversing means being operatively engagable with portions of the sealing means to position the sealing means in the closed first position to interrupt communication between the flow channel and the first chamber, the traversing means being engagable with the vehicle and being movable with the vehicle and the traversing means engaging portions of the sealing means to position the engaged portions of the sealing means in the second open position to establish communication between the vehicle storage bin and the first chamber via the flow channel while the traversing means is moving with the vehicle, the traversing means engaging portions of the sealing means to position the engaged portions of the sealing means in the closed first position after the traversing means has moved over such portions of the sealing means.

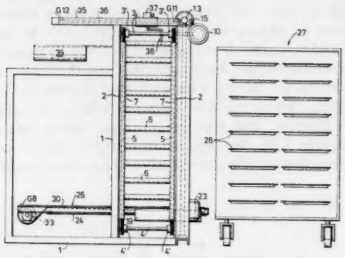
4,277,216
TRANSPORT ARRANGEMENT FOR TRAYS AND THE LIKE

Gunnar V. Lindberg, Box 137, 162 12 Vällingby, Sweden

Filed Mar. 28, 1979, Ser. No. 24,687
Claims priority, application Sweden, Apr. 3, 1978, 7803738
Int. Cl.³ B65G *1/00, 65/00*
U.S. Cl. 414—331 **3 Claims**

1. An arrangement for transferring trays and the like in one direction or the other between a trolley and a conveying path via a vertical conveyor located in a stand, the vertical conveyor comprising two pairs of endless vertical transport means, such as chains, with equally spaced horizontal carrying strips, the pairs of endless vertical transport means, between themselves defining a space, in which trays or the like can be supported by the carrying strips, a horizontal conveyor with a mechanically driven conveying belt and made with its length sufficient to carry two of the trays or the like along the conveying belt, means carrying said horizontal conveyor and enabling it to be shifted horizontally as well as vertically within said space, and a displacement member being located at the upper portion of the vertical conveyor, said horizontal conveyor carrying means being characterized in that: two

laterally spaced apart vertical beams are secured on said stand, exterior of the vertical conveyor, with the spaced apart distance between beams being greater than the width of the horizontal conveyor; a cross-beam mounted horizontally between and with its ends engaging and guided for vertical movement in associated said vertical beams; a pair of vertical screw spindles engaging and in threaded drive engagement with said cross beam, each screw spindle secured to an associated said



vertical beam; means to concurrently rotatably drive said screw spindles to vertically move said cross-beam; two horizontal carrying bars rigid on and disposed transversely of said cross-beam providing support means for the horizontal conveyor; an electric drive motor supported on said cross-beam; and drive means mounted on said carrying bars driven by said electric drive motor, engaging said horizontal conveyor and adapted to move said horizontal conveyor along its horizontal shift path.

4,277,217

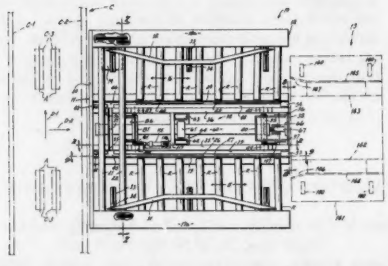
LOAD TRANSFER APPARATUS

James S. Miller; Frank M. Lauyans, and Edwin T. Hilger, all of Louisville, Ky., assignors to A-T-O Inc., Willoughby, Ohio

Filed Jun. 7, 1979, Ser. No. 46,938

Int. Cl.³ B65G *25/08*

U.S. Cl. 414—395 **32 Claims**



1. Transfer apparatus for transferring loads in a direction between a load conveyor and a load transporting cart, said load conveyor including means for moving said load toward said transfer apparatus, and said load having a predetermined dimension parallel to said direction, said transfer apparatus including:

an elongated frame and conveying means supported therein for receiving loads at least from said conveyor, and for conveying loads between said conveyor and said cart,

said cart being movable into a position adjacent said elongated frame,

said conveying means defining two separate, spaced apart, conveying paths extending in substantially the same said direction, loads on said transfer apparatus spanning portions of said two paths, and

load shifting means disposed between said conveying paths and having forward and rearward rotatable dogs thereon, said rearward dog being selectively engageable with loads for shifting loads from said transfer apparatus off said conveying means in said same direction onto said cart, said forward dog being extensible outwardly from said elongated frame a distance at least equal to said predetermined dimension and into an area coincidental with that occupied by said cart for selectively and positively pushing loads onto said cart and pulling loads from said cart.

32. Apparatus as in claim **1** further including means independent of said loads for selectively and positively engaging said dogs and rotating them beneath said conveying path.

4,277,218

EXAMINATION INSTALLATION

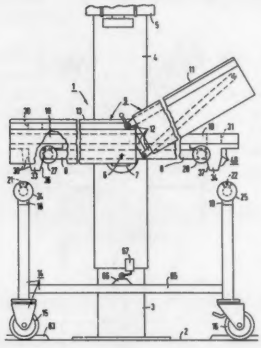
Gerd Schweichler, Dormitz, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,382

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812074

Int. Cl.³ G01N *23/00*

U.S. Cl. 414—401 **10 Claims**



1. An examination installation comprising a table support, a transport carrier, a patient positioning table that can be transferred from the transport carrier onto the table support, couplings for the connection of the patient positioning table with the transport carrier and with the table support that adjust themselves upon the relative approach of the patient positioning table to the transport carrier and to the table support, each of the couplings **(30, 31, 32, 85)** comprising at least two latches **(45** through **48, 68, 69)** movable into a respective latching position, means whereby one of said latches in its latching position couples the patient positioning table **(9, 70)** to the transport carrier **(14, 71)** and can be pressed out of the latching position and into a non-engaged position by means of the table support **(4, 7, 8, 72)**, and means whereby the other of said latches in its latching position couples the patient positining table to the table support and can be pressed out of its latching position into a non-engaged position by means of the transport carrier.

4,277,219

FRONT LOADING, SIDE UNLOADING DUMPER

Charles F. Rivers, 15318 Warwick, Detroit, Mich. 48223

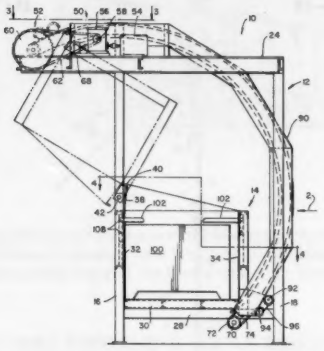
Filed Aug. 15, 1978, Ser. No. 933,713

Int. Cl.³ B65G *65/34*

U.S. Cl. 414—421 **4 Claims**

1. A dumper comprising a support frame, a cradle, generally horizontal pivot means mounting said cradle on said frame for movement from a loading position to an unloading position, drive means for moving said cradle from said loading position to said unloading position, said drive means comprising a

flexible chain, and means connecting the ends of said chain to said cradle comprising a pair of sprockets being rigidly secured to said cradle and each having teeth around its periphery, the axis of each of said pair of sprockets being parallel to the axis of said pivot means, one end portion of said chain being engaged with the teeth at least part way around one of said pair of sprockets and rigidly secured thereto, the other end portion of said chain being engaged with the teeth at least part way around the other of said pair of sprockets and rigidly secured thereto.

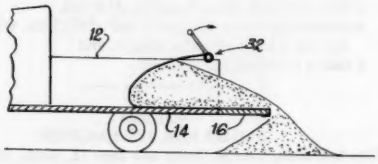


4,277,220

COMBINED LOAD COVER AND UNLOADER

Frederick R. Wiley, 343 E. Lexington Ave. Suite 108, El Cajon, Calif. 92020

Filed Jan. 31, 1980, Ser. No. 117,099
Int. Cl.³ B60P *1/00, 7/04*
U.S. Cl. 414—539 **4 Claims**



1. A combined load cover and unloader for use in handling amorphous material and the like in a hauling vehicle having a box opening to the rear of the vehicle, said combined load cover and unloader comprising:

a. an elongated apron of flexible, thin gauge material, with high tensile strength and of a width approximating the width of the box, one end of said apron having means for securement across the rear end portion of the box, and said apron having a length greater than twice that of said box to extend underneath a load of material in said box, around the forward end of such load and back over the load as a cover therefor;

b. a winch roller of a length substantially equal to the width of said apron, removably and operably mountable across the upper rear end portion of the box; and

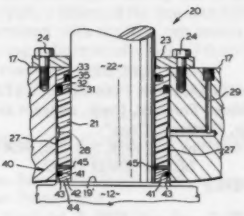
c. said winch roller having means for manual operation thereof and having means for easily removably attaching a second end of the apron to said winch roller.

4,277,221

WICKET GATE BEARING SEAL

Feodor Kanger, Montreal, Canada, assignor to Dominion Engineering Works Limited, Lachine, Canada

Continuation-in-part of Ser. No. 785,504, Apr. 7, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 934,708
Claims priority, application Canada, Apr. 22, 1976, 250770
Int. Cl.³ F03B *3/18*
U.S. Cl. 415—160 **8 Claims**



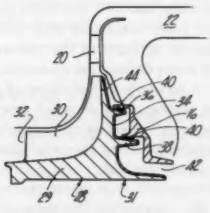
1. In a turbo-hydraulic machine having a plurality of wicket gates, each pivotally mounted on a top stem extending from a recess in a headcover of the machine and a bottom stem extending into a recess within a bottom ring of the machine, each stem having bearing bushing means thereon positioning said stem in centred relation in a said recess, a stem seal located at least partially within said recess interposed between the bushing means and extending outwardly from the recess in sealing relation with an end surface of the gate, said seal having an O-ring seal extending thereabout in sealing relation with the recess; seal means at the end of said bushing means remote from said gate to provide a sealing between the stem and the bushing and between the bushing and the wall of the recess; and liquid supply passage means adjacent said bushing means to provide flushing liquid to the recess for passage between said stem and said stem seal, to flow outwardly therefrom between said stem seal and said gate end surface, to substantially preclude the ingress of working fluid from within the machine into said recess.

4,277,222

TURBINE ENGINE COMPRESSOR

Dennis E. Barbeau, Temperance, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 11, 1979, Ser. No. 2,659
Int. Cl.³ F01D *5/08*
U.S. Cl. 415—177 **6 Claims**



1. In a turbine engine having a support housing and a shaft means rotatably mounted within the support housing, an air compressor means connected to the shaft means for axially compressing air from an inlet end to an outlet end, said compressor means including an impeller at its outlet end for directing the compressed air through a passageway and into a combustion chamber, said impeller having an annular and substan-

tially radially extending back face at the outlet end of the compressor, the improvement which comprises:

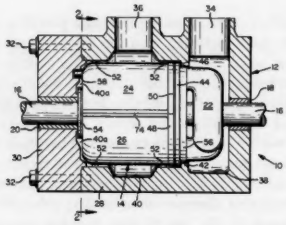
a coating of thermal insulating material on the back face of the impeller whereby said thermal insulating coating thermally insulates the impeller from hot leakage gases along the back face of the impeller.

4,277,223

CASE CONSTRUCTION FOR MULTI-STAGE PUMP

Richard M. Nelson, Portland, Oreg., assignor to Guy F. Atkinson Company, Portland, Oreg.

Filed Nov. 29, 1979, Ser. No. 98,473
Int. Cl.³ F04D *29/42*
U.S. Cl. 415—199.1 **7 Claims**



1. A pump apparatus comprising:

an outer case assembly having an inlet port leading to a suction chamber at a forward end of the pump and an outlet port leading to a discharge chamber at a rearward end of the pump;

a shaft sealably extending through walls of the outer case assembly;

an inner case assembly disposed within the outer case assembly and having a plurality of pump stages which are axially spaced along the shaft to povide fluid communication between the suction chamber and the discharge chamber, the pump stages including a first stage and one or more booster stages, each pump stage being characterized by an impeller secured for rotation with the shaft, the inner case assembly having an interior network of hydraulic passages for fluid communication between successive pump stages, the inner case assembly being characterized by a forward case section of a unitary annular construction housing the first pump stage and two rearward case sections housing the booster pump stages, an axial joint being defined between adjacent surfaces of the rearward case sections, a radial joint being defined between a surface of the forward case section and adjacent surfaces of the assembled rearward case sections, the forward case section being surrounded at least in part by the suction chamber, the rearward case sections being surrounded at least in part by the discharge chamber; and

locating means provided on an interior wall of the outer case assembly for preventing the forward movement of the forward case section beyond a predetermined position within the outer case;

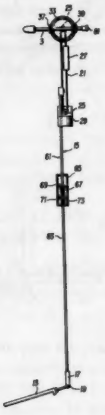
whereby the fluid pressure within the discharge chamber during operation of the pump applies a radially acting force to the rearward case sections to form a fluid-tight seal at the axial joint and applies an axial force acting in the forward direction against the rearward case sections to form a fluid-tight seal at the radial joint.

4,277,224

FAN ATTACHMENT FOR ROCKING CHAIRS

Roy L. Lundgren, 1360 NE. 48th Ct., Fort Lauderdale, Fla. 33334

Filed Dec. 10, 1979, Ser. No. 102,133
Int. Cl.³ A47C *7/74*
U.S. Cl. 416—58 **13 Claims**



1. A fan drive by the oscillatory motion of a rocking chair comprising:

a means for attaching the fan to a moving part of the rocking chair,

a vertical rod hingedly connected to the attaching means,

an endless belt connected to the top of the vertical rod at a point along the belt,

means for holding the belt in a vertically elongated loop, the belt being free to move in response to oscillatory motion of the vertical rod,

a horizontal shaft located near the upper end of the belt loop,

a set of gears in engagement with the belt and the horizontal shaft, and arranged to transform oscillatory motion of the belt into continuous rotation of the shaft,

fan blades mounted on the shaft,

a tube covering the rod and toothed belt,

a supporting base at the lower end of the tube, whereby the fan can stand vertically upright, and

a casing covering the gear set.

4,277,225

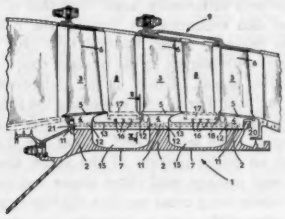
ROTOR FOR JET ENGINES

Claude Dubois, Vert St Denis, and Jean M. Surdi, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Sep. 20, 1978, Ser. No. 944,205
Claims priority, application France, Sep. 23, 1977, 77 29240
Int. Cl.³ F01D *5/06*
U.S. Cl. 416—198 A **7 Claims**

1. An axial type rotor for jet engines, particularly for compressors, having an alternating stack of disks and of annular elements having external diameters smaller than those of said disks so as to provide spaces for stationary blades, each stage of said rotor comprising a number of identical blades, characterized in that in each disk two series, each comprising uniformly distributed axial grooves equal in number to that of the blades, are arranged, the grooves of a first series being aligned from one end of the rotor to the other, with the grooves of said first series having a configuration adapted to receive a root of a blade, the grooves of the second series, interspaced between those of said first series and having a configuration adapted to receive identical projections of braces equal in number to that of the blades, said projections insuring the axial immobilization

of the blades by means of a platform carried by said braces and abutting said blades, the configuration of the grooves of the first and second series being such that said grooves cooperate



respectively with the roots of the blades and the projections of the braces, to assure a joint impeding of all radial motion with respect to the rotor of the blades and of the braces.

4,277,226

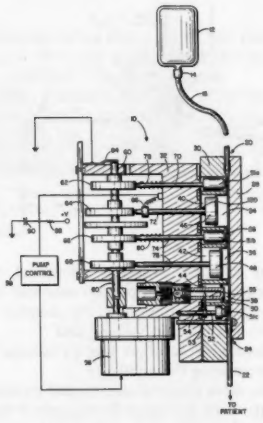
IV PUMP WITH EMPTY SUPPLY RESERVOIR AND OCCLUSION DETECTOR

G. Kent Archibald, White Bear Lake, Minn., assignor to Avi, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 19,223, Mar. 9, 1979, Pat. No. 4,236,880. This application Sep. 21, 1979, Ser. No. 77,677

Int. Cl.³ A61M *5/14;* **F04B** *49/02*

U.S. Cl. 417—38 **13 Claims**



1. A volumetric infusion pump for pumping fluid from a reservoir to a patient, the volumetric infusion pump comprising:

a pump inlet for connection to the reservoir;

a pump outlet for connection to the patient;

a first pumping chamber connected between the pump inlet and the pump outlet, the first pumping chamber having a first cylinder, a first piston reciprocally movable in the first cylinder, and first flexible rolling diaphragm means between the first cylinder and the first piston, the first pumping chamber having a variable volume depending upon the position of the first piston in the first cylinder;

first cam means;

first cam follower means connected to the first piston and positioned to follow the first cam means;

first valve means between the pump inlet and the first pumping chamber for permitting fluid flow from the pump inlet to the first pumping chamber during a fill portion of each pumping cycle in which the first cam means permits movement of the first piston in a direction which increases the volume of the first pumping chamber;

second valve means between the first pumping chamber and the pump outlet for preventing fluid flow from the first pumping chamber to the pump outlet during the fill portion of each pumping cycle; and

means for sensing contact between the first cam means and the first cam follower means and providing a signal indicative of whether the first cam follower means is in contact with the first cam means during the fill portion of each pumping cycle, a failure of the first cam follower means to maintain contact with the first cam means during the fill portion being indicative of a lack of fluid being supplied from the reservoir to the pump inlet.

4,277,227

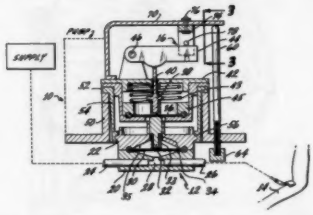
APPARATUS FOR CONVERTING A PUMP TO A CONTROLLER

Jon A. Jenkins, Rancho Santa Fe, Calif., assignor to Imed Corporation, San Diego, Calif.

Filed Jul. 2, 1979, Ser. No. 53,981

Int. Cl.³ B04B *21/00;* **A61M** *5/20*

U.S. Cl. 417—63 **40 Claims**



1. In combination for use with a pump for introducing fluid to a receiver and for controlling the pressure of the fluid introduced by the pump to the receiver, the pump having detent means,

an output line for passing the fluid from the pump to the receiver,

a resilient diaphragm connected in the output line for constraint in accordance with the pressure of the fluid in the line,

means movable with the diaphragm for obtaining the production of an output indication when the pressure of the fluid in the output line has reached a particular level,

a housing holding the output line, the diaphragm and the movable means, and

detent means on the housing for co-operating with the detent means on the pump for releasably holding the housing in a particular fixed relationship with the pump.

4,277,228

RADIAL PISTON PUMP

Jörg Dantlgraber, Lohr/Main, Fed. Rep. of Germany, assignor to G. L. Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 796,879

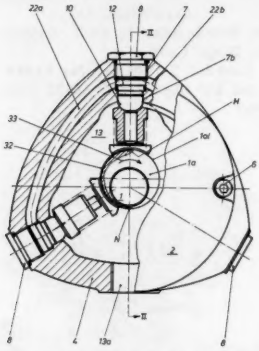
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622010

Int. Cl.³ F04B *1/04*

U.S. Cl. 417—273 **9 Claims**

1. A radial piston pump, comprising a housing bounding a suction chamber therein; at least one valve piston unit mounted in said housing, said unit including pressure valve means defining together with said housing a pressure chamber, a movable piston provided with a radial inner passage which operatively communicates said suction chamber with said pressure chamber, said piston having a head section located adjacent to said pressure valve means and bounding a first radial portion of said

passage and a bottom section spaced from said head section and bounding a second radial portion of said passage, and suction valve means located in said first radial portion of said passage which is bounded by said head section of said piston and operative for opening and closing said passage so as to respectively establish and interrupt said communication between said suction chamber and said pressure chamber; and a rotatable eccentric in said housing having an axis of rotation and a contact surface which is in surface contact with said bottom section of said piston so as to displace the latter relative to said axis of said eccentric and to tilt said piston around a further axis which is spaced from said axis of said eccentric, said contact surface of said eccentric being provided with a circumferential groove operatively communicating said second radial portion of said radial passage of said piston with said suction chamber so that a working fluid flows from said cir-



cumferential groove of said eccentric radially directed into said radial inner passage of said piston, first into said second radial section of said radial passage which is bounded by said bottom portion of said piston, and then into said first radial section of said radial passage which is bounded by said head portion of said piston and thereby to said suction valve means, said contact surface of said eccentric having upper and lower reversal points and being rotatable in a predetermined direction so that a suction stroke of said piston is performed when the latter moves in contact with said contact surface of said eccentric between said upper and said lower reversal points thereof, said groove extending in a circumferential direction of said eccentric to a length equal to half of the length of said contact surface in said circumferential direction and between said upper and said lower reversal points so that said passage of said piston communicates with said groove of said eccentric during said suction stroke of the latter.

4,277,229

HIGH PRESSURE FLUID DELIVERY SYSTEM

Amos Pacht, Houston, Tex., assignor to Partek Corporation of Houston, Houston, Tex.

Filed Nov. 21, 1977, Ser. No. 853,113
Int. Cl.[3] F04B *39/14, 21/02*
U.S. Cl. 417—454 **17 Claims**

1. A reciprocating pump capable of delivering fluid at relatively high pressures in excess of 5000 psi, comprising:

a fluid cylinder block having formed therein:

at least one bore extending through the block from a first side thereof to a second side of the fluid cylinder block; and

including a valve chamber therein;

a stuffing box with a bore therethrough, mounted against said first side of the fluid cylinder block;

a plunger, for reciprocation in the bore in said stuffing box to a position adjacent said interior end of the passage, the bore and the passage each having a cross section only sufficiently larger than that of the plunger to allow said reciprocation;

a first sealing ring assembly for sealing between the stuffing box and the fluid cylinder block and having an inner diameter only sufficiently larger than that of the plunger to allow said reciprocation through the ring assembly, whereby the area sealed by said first ring assembly is minimized with respect to the plunger size;

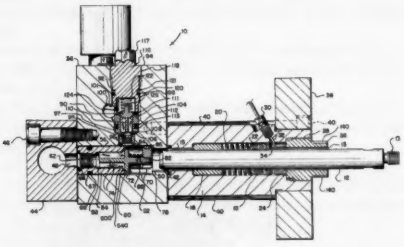
suction valve means, seated in the cylindrical chamber against the wall thereof and extending the length thereof, for permitting fluid to flow through said valve means, when open, from said second side of the fluid cylinder block to an outlet portion of the valve means located toward said passage, said valve means and said chamber having conforming cross sections slightly larger than the cross section of the passage, whereby the valve means can seat against the interior end of the chamber;

a second sealing ring assembly around the outer surface of the suction valve means for sealing between the valve means and the wall of the chamber, whereby the cross section of the valve means sealed by said second assembly is relatively small, being no greater than said conforming cross section of the valve means;

a suction manifold mounted against said second side of the fluid cylinder block, engaging the suction valve means and in fluid communication therewith;

said fluid cylinder block further having formed therein:

a generally cylindrical opening extending from an outer wall of the fluid cylinder block and forming a perpen-



dicular junction with the cylindrical chamber, said opening having a first portion near said chamber and a second portion farther from the chamber than said first portion and adjacent thereto, and

a discharge port adjacent said cylindrical opening and communicating therewith;

a discharge valve means seated in said cylindrical opening against the wall thereof, at least partly in the second section thereof, and having an intake immediately adjacent said outlet portion of the suction valve means, for permitting, when open, fluid to flow from the suction valve means into said intake and through the discharge valve means toward said discharge port, the cross section of said first portion of the cylindrical opening being smaller than the cross sections of said second portion and of the discharge valve means conforming thereto, whereby the discharge valve means seats against the end of said second portion nearest said chamber, said discharge valve means and said second portion having relatively small, conforming cross sections, no greater than the cross section of the cylindrical chamber, but not so small as to present to the plunger a substantial fluid resistance in said discharge valve means;

a third sealing ring assembly around the outer surface of the discharge valve means for sealing between the discharge valve means and the wall of the cylindrical opening, whereby the cross section of the discharge valve means sealed by said third assembly is relatively small, being no

greater than said conforming cross section of said discharge valve means in said portion;

a generally cylindrical discharge valve cover, fastened into said cylindrical opening and bearing against the discharge valve means and having a cavity therein providing fluid communication between the discharge valve means and said discharge port, said cover and the cylindrical opening having conforming cross sections slightly larger, at most, than said cross section of the discharge valve means in said second portion of the cylindrical opening;

a fourth sealing ring assembly around the outer surface of the valve cover for sealing between said cover and the wall of the cylindrical opening, whereby the cross section of the valve cover sealed by said fourth assembly is relatively small, being no greater than said conforming cross section of the valve cover,

whereby, in operation, the reciprocation of said plunger draws fluid from the suction manifold through the suction valve means and drives the fluid through the discharge valve means and said cover cavity into the discharge port at relatively high pressures, with resulting high fluid pressures inside the pump being applied, over the cross sections of said sealing assemblies, to elements of the pump associated therewith, said relatively small sizes of the sealed cross sections causing the forces applied to said elements to be comparatively small, and

whereby the close arrangement of the plunger and said valve means, along with the relatively small sizes of the valve means cause a comparatively small amount of fluid to be enclosed by the valve means and plunger, providing thereby improved efficiency of the pump.

4,277,230

GEAR MACHINE OPERABLE AS PUMP OR MOTOR WITH AXIALLY SPACED AND CIRCUMFERENTIALLY OFFSET PAIR OF GEARS

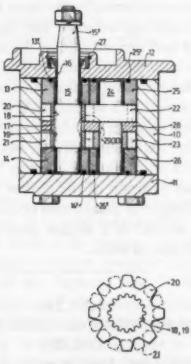
Karl-Heinz Müller, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 863,301, Dec. 22, 1977, abandoned. This application Nov. 15, 1979, Ser. No. 94,661

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705249

Int. Cl.³ F04C 2/18, 11/00, 15/04; F16D 1/06

U.S. Cl. 418—131 **9 Claims**



1. In a gear machine operable as pump or motor, a combination comprising housing means including a central portion having an inner surface and opposite open ends and a pair of covers closing said opposite ends and defining with said inner surface of said central portion a chamber; a first shaft mounted for rotation about its axis in said chamber and projecting with an end portion thereof through an opening in one of said covers to the outside of said housing means; a pair of first external gears arranged spaced from each other in axial direction and offset in circumferential direction from each other about portions of said first shaft, each of said first gears being provided with an internal gearing having uniformly spaced teeth and said portions of said first shaft being provided with an external gearing meshing with said internal gearing of said pair of first gears to connect said pair of first gears to said shaft for rotation therewith, the number of gear teeth of said internal gearings on said first pair of gears being an even multiple of the number of external gear teeth thereon, the number of teeth of the internal gearings enabling the offset to be one half or other than one half the pitch of the external gear teeth; a second shaft arranged parallel to said first shaft in said housing means; and a pair of second external gears on said second shaft respectively in direct driving engagement with said first pair of external gears.

4,277,231

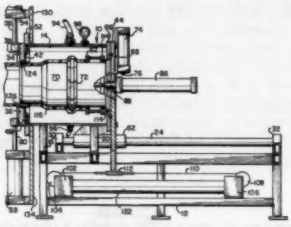
METHOD AND APPARATUS FOR PRESSURE FORMING PIPE BELLS

John H. Gordon, 855 Brandywine Rd., Downingtown, Pa. 19335

Filed Sep. 21, 1979, Ser. No. 77,657

Int. Cl.³ B29D 23/00

U.S. Cl. 425—387.1 **16 Claims**



1. In a pipe belling apparatus, the combination of

a pressure chamber means comprising enclosing sidewalls, a front and a back to define an enclosed pressure chamber;

a bell shaping mandrel means mounted in the back and positioned in the pressure chamber to form a bell shape upon one end of a length of pipe;

a front opening in the pressure chamber means front of size suitable to receive the said pipe end therein;

separable front plate means movable relative to the front from an open position to receive the pipe end to a closed position to close the front opening about the end of the pipe;

pressure inlet means in the pressure chamber means to pressurize the pressure chamber whereby the end of the pipe is pressed against the mandrel means; and

sealing means about the front opening to seal the front opening against the loss of pressure about the pipe end during the pipe belling operation.

4,277,232

APPARATUS FOR FORMING A MOLDED SQUEEZE TOY INCLUDING WHISTLE

Anthony P. Taluba, Lebanon, N.J., and Paul A. Taluba, Morrisville, N.Y.

Division of Ser. No. 727,473, Sep. 28, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 923,446

Int. Cl.³ B29C 17/07

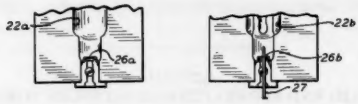
U.S. Cl. 425—525 **1 Claim**

1. In combination with a molding system for blow-molding an air-filled squeeze body, wherein said system comprises means for producing a parison of thermoplastic material, a pair of primary molds shaped to clutch said parison between them to impose thereon a preselected shape, and means comprising a blow-pin operative in synchronism with the closing of said primary molds for inflating said parison, and upon the opening

of said primary molds for blowing the molded squeeze body free from said molds and said blow-pin; the improvement comprising:

means for forming a whistle cavity which is integral with said squeeze body simultaneously with the formation of said squeeze body, said means comprising a pair of insert halves interposed into said primary molds;

each of said insert-halves comprising a semi-annular protuberance substantially closed at one end by a semi-annular closure disposed substantially concentric with the principal axis between said insert-halves for forming said whistle cavity;



said semi-annular closures constructed to form between them in closed position of said primary molds a central blow-hole to accommodate the incursion of said blow-pin into a position coinciding with the center of said whistle cavity, and said blow-pin constructed to form at least one whistle hole in said position upon the freeing of said squeeze body from said blow-pin;

wherein each of said protuberances is semi-cylindrical in form and substantially closed at its inner end by a semi-annular disk, said protuberances being constructed to form between them a cylindrical whistle cavity directed inwardly from the external surface of said body, the blow-hole formed by said insert means being disposed in axial relation to said cylindrical whistle cavity.

4,277,233

TURNTABLE APPARATUS FOR MOLDING TIRES

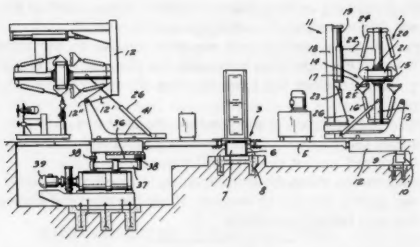
Erich Grünner, Voltagasse 43/23/1, 1210 Wien, Austria

Filed Jul. 17, 1978, Ser. No. 925,462

Claims priority, application Austria, Jul. 15, 1977, 5149/77

Int. Cl.³ B29F *1/00*; B29C *6/00*; B29H *5/02*

U.S. Cl. 425—588 **8 Claims**



1. In an apparatus for molding tires, a combination comprising a plurality of multi-part molds each comprising an inner split core configurated in accordance with the inner surface of the tire to be molded and a plurality of outer mold parts arranged about the core and configurated in accordance with the outer surface of the tire; a plurality of mold carriers, one for each of said multi-part molds; a first turntable having a vertical axis and carrying on an upper surface thereof said plurality of mold carriers circumferentially displaced from each other; a second turntable adjacent said first turntable and having an axis parallel to that of said first turntable and being provided at its upper surface with a first plurality of depositing stations circumferentially displaced from each other and equal in number to the plurality of multi-part molds for receiving said cores and a second plurality of depositing stations circumferentially displaced from each other and equal in number to said first plurality of depositing stations for receiving finished tires with the cores retained therein; and means for turning said first and said second turntables synchronously and stepwise about their axes.

4,277,234

PERCUSSIVE FLASHCUBE ARRANGEMENT

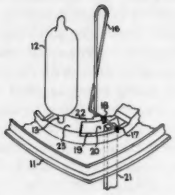
Norman C. Fulmer, South Euclid, and Norman E. Kewley, Pepper Pike, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 700,139, Jun. 28, 1976, abandoned.

This application Aug. 17, 1979, Ser. No. 67,266

Int. Cl.³ F21K *5/00*

U.S. Cl. 431—361 **9 Claims**



1. A photoflash unit comprising a base member having a top surface lying substantially in a horizontal plane, a flash lamp having a percussive-type ignition member extending above said top surface of the base member, a striker member for striking said ignition member, a cocking member extending above said top surface a given distance and normally holding said striker member in a cocked position on said top surface and away from said ignition member, and a trigger opening through said base member beneath said cocked position of the striker member and comprising a side toward said ignition member and a pair of opposed sides extending away from said ignition member, said cocking member being at or near a first side of said pair of sides of the trigger opening, wherein the improvement comprises a rib extending above said top surface of the base member and partly along the second one of said pair of sides of the trigger opening, said rib having a substantially flat upper surface substantially the same height as said cocking member and extending between said ignition member and a point at or near said second side of the trigger opening which point is substantially laterally across said trigger opening from said cocking member, said striker member extending substantially laterally across and beyond said trigger opening so that when said striker member is released over the top of the said cocking member it will be guided by said rib in a substantially straight path to a point on said ignition member that is higher than said cocked position of the striker member and substantially the same height as that of said cocking member, said base member being devoid of a striker member guiding rib along said first of the pair of sides.

4,277,235

PROCESS OF PRODUCING COOL AGGLOMERATED SOLIDS

Johann Haslmayr, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 11, 1980, Ser. No. 111,213

Claims priority, application Austria, Jan. 30, 1979, 660/79

Int. Cl.³ F26B *9/12*; F27D *15/02*

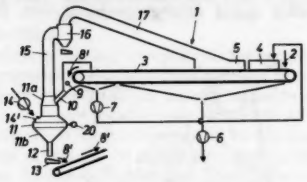
U.S. Cl. 432—18 **26 Claims**

26. Dividing means for dividing pieces of agglomerated solids having first and second thickness portions which have different properties, comprising

a wedge-shaped hammer having a transverse striking edge

and longitudinally reciprocable to move said striking edge in a predetermined plane, and

guide means for presenting said pieces and for presenting



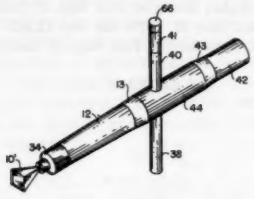
them to said striking edges to be struck thereby with such an orientation that said first thickness portion is on one predetermined side and said second thickness portion is on the other side of said plane.

4,277,236

ORTHODONTIC INSTRUMENT FOR APPLYING ELASTIC LIGATURES

Craven H. Kurz, 10921 Wilshire Blvd., Suite 512, Los Angeles, Calif. 90024

Filed Mar. 31, 1980, Ser. No. 135,976
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—3 **3 Claims**



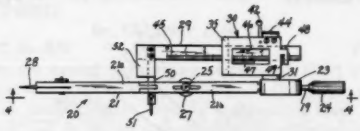
1. An orthodontic instrument for applying annular elastic ligatures to brackets on the teeth of a patient for retaining the arch wire on the brackets, said instrument comprising: an elongated housing having a forward end and a rear end; an elongated dispenser member received in said housing for reciprocal movement therein along the longitudinal axis thereof, said dispenser member having an enlarged end at the forward end of the housing; a plurality of annular elastic ligatures stacked adjacent to one another on said dispenser member in coaxial relationship therewith, a pusher member slidably mounted in said housing in coaxial relationship with said dispenser member and in position to engage the rear ligature of the stack on said dispenser member; resilient means biasing the pusher member toward the forward end of the housing to move the forward ligature of the stack partially along the enlarged end of the dispenser member; manually operable release means engaging the forward ligature to force the forward ligature along the enlarged end of the dispenser member and over the extremity thereof, said release means comprising a plurality of push rods extending axially along the dispenser member under the ligature therein toward said enlarged end of said dispenser member, and manually operable means for moving said dispenser member axially with respect to the housing towards the rear end of the housing to cause said push rods to move forward relative to said dispenser member so as to move the forward ligature along the enlarged end of the dispenser and over the extremity thereof.

4,277,237

JAW IMPLANT MEASURING INSTRUMENT

Saul R. Dermer, 3226 College Dr., Columbus, Ga. 31907

Filed Apr. 21, 1980, Ser. No. 141,765
Int. Cl.³ A61C *19/04*
U.S. Cl. 433—72 **10 Claims**



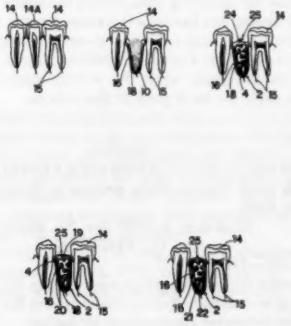
1. A dental instrument for measuring a patient's jaw to determine the size, configuration and implantation locations of an implantable denture-supporting frame of the type comprising a generally U-shaped body with a pair of rear end tips and a depending front support lug, said instrument comprising a pair of main legs, pivot joint-defining means pivotally connecting the front ends of the main legs, means for adjusting the angle between said main legs, said main legs having pointed marking elements on their free ends, guide sleeve means having an elongated guide channel, means rigidly supportingly connecting said guide sleeve means to said joint-defining means with said guide channel extending substantially in the median plane perpendicular to the plane of the main legs and extending in an axial direction parallel to the plane of the main legs, a longitudinally adjustable slide bar mounted in said guide channel, a depending arm secured to said slide bar and extending between said main legs substantially in said median plane, and marking point means on the bottom end of said depending arm.

4,277,238

ARTIFICIAL BONELIKE GRAFT AND METHOD FOR PRODUCING THE SAME

Masataka Katagiri, 2398-2 Sakai, Niigata-shi, Niigata, Japan

Filed Mar. 30, 1979, Ser. No. 25,730
Claims priority, application Japan, Sep. 28, 1978, 53/120618
Int. Cl.³ A01N *35/02*
U.S. Cl. 433—201 **13 Claims**



1. A method for producing an artificial bonelike graft comprising the steps of:

(a) fixing a bonelike piece taken from a mammal with a fixing agent selected from the group consisting of formalin, alcohol and paraformaldehyde,

(b) decalcifying said piece with a decalcifying agent comprising an acid selected from the group consisting of formic acid, hydrochloric acid, nitric acid, oxalic acid and citric acid,

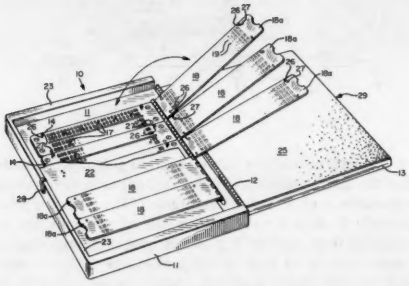
(c) defatting said piece with alcohol, and

(d) freeze drying said piece.

4,277,239
SLATE FOR WRITING BRAILLE

Mariano R. Genis, 7a. Calle 3-37 Zona 1, Guatemala City, Guatemala

Filed May 14, 1979, Ser. No. 38,487
Int. Cl.[3] G09B 21/02
U.S. Cl. 434—115 5 Claims



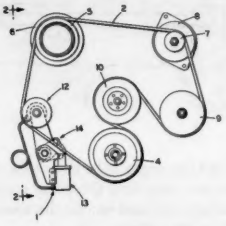
1. A slate for writing Braille comprising:
a frame forming a generally rectangular opening;
a cell plate affixed to the frame extending across the opening and having a plurality of rows of cell openings for forming Braille characters with a stylus;
a receiving plate having indentations therein and hinged to one end of the cell plate such that a sheet of Braille writing paper can be interposed between the cell plate and the receiving plate, said cell plate and receiving plate having aligned pins and holes for piercing and locking the paper in place when the receiving plate is closed against the cell plate;
said frame having an upstanding wall means extending about three sides and forming a paper locating and confining space closely fitted to the size of the paper so that the operator can by touch easily insert the paper properly within the confining space against the edges formed by the wall means then close the receiving plate over the paper to lock it in place; and
a back plate movably attached to the frame and sized to fit against the receiving plate within the space formed by the wall means, and having a thickness greater than the height of the wall means sufficient to extend outwardly beyond said wall means when the receiving plate is pressed firmly against the paper when the writing slate is placed on a table with the back plate at the bottom.

4,277,240
HYDRAULIC BELT TENSIONER CONSTRUCTION

Derald H. Kraft, Canton, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Filed Aug. 6, 1979, Ser. No. 63,828
Int. Cl.[3] F16H 7/12
U.S. Cl. 474—110 18 Claims

1. A hydraulic belt tensioner construction for automatically tensioning an endless belt of the drive system for vehicle accessories, said tensioner construction including:
(a) piston means adapted to be mounted in a fixed position with respect to the endless drive belt;
(b) lever means operatively engaged and moved by the piston means toward the drive belt;
(c) tensioning assembly means mounted on the lever means and adapted to be moved into engagement with the drive belt upon movement of the lever means by the piston means; and
(d) the tensioning assembly means including pump means, reservoir means for containing a supply of hydraulic fluid, and pulley means drivingly engaged with the pump

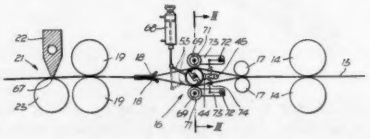


means, said pulley means being adapted to be engaged with and driven by the drive belt for actuating the pump means to supply hdyraulic fluid from the reservoir means under pressure to the piston means to actuate the piston means and move the lever means to bring the tensioning assembly means into engagement with the drive belt.

4,277,241
APPARATUS FOR FORMING BAGS OF THERMOPLASTIC MATERIAL

Ehrhart Schulze, Fellbach, Fed. Rep. of Germany, assignor to Karl Heinz Stiegler, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 42,160
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1978, 2824989
Int. Cl.[3] B31B 1/14
U.S. Cl. 493—196 10 Claims



1. An apparatus for the manufacture of plastic bags from half-tubes of at least one double-ply thermoplastic sheeting the two plies of which bear closure strips on facing inner edges thereof, to form a snap-fastener-like closure of the bag openings comprising:
a welding station having a welding ledge which extends transversely to the direction of conveyance separating the individual bags from the sheeting by separation-welding;
conveying means for feeding said sheeting to said welding station;
a milling device upstream of said welding station;
means for intermittently engaging said milling device with said closure strips whereby facing portions of said closure strips are milled off; and
means for aligning said thermoplastic sheeting with said welding ledge at the location where said closure strips have been milled off.

4,277,242

IONIZING RADIATION TREATMENT OF WOOL TEXTILES WITH RESIN FOR SHRINK RESISTANCE

Keith G. McLaren, Beverly Hills, Australia, assignor to Australian Atomic Energy Commision, Coogee, Australia

Filed Jan. 18, 1978, Ser. No. 870,299
Claims priority, application Australia, Feb. 7, 1977, PC8975
Int. Cl.[3] D06M *3/02, 13/00*
U.S. Cl. 8—128 A 10 Claims

1. A method of treating a wool textile for imparting shrink-resistant properties which comprises applying to the textile a dose of up to 10 megarads of ionizing radiation and a thin application of a textile polymer resin, said textile polymer resin being a resin which in vitro is not cured by said dose of up to 10 megarads of ionizing radiation but is cured by said ionizing radiation in the presence of the wool fibers of the wool textile whereby a shrink-resistant property is imparted to the wool textile, the process being carried out substantially at ambient temperature.

4,277,243

PROCESS FOR PRODUCING DURABLE-PRESS COTTON FABRICS WITH IMPROVED BALANCES OF TEXTILE PROPERTIES

Stanley P. Rowland, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 31, 1979, Ser. No. 8,130
Int. Cl.[3] D06M *13/38, 13/40*
U.S. Cl. 8—183 6 Claims

1. A process for imparting to cotton and other cellulosic fabrics an improved balance in physical porperties in the production of durable-press fabrics, the process comprising:

(a) impregnating the cellulosic textile with an aqueous solution containing a difunctional or polyfunctional N-methylol reagent, a Bronstead acid or acid-generating catalyst, and a phosphate salt or mixture of salts, and

(b) drying and curing the impregnated textile to obtain a suitable reaction.

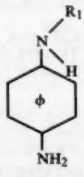
4,277,244

DYE COMPOSITIONS FOR KERATINIC FIBERS CONTAINING PARAPHENYLENEDIAMINES

Andree Bugaut, Boulogne, and Patrick Andrillon, Aulnay, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 722,818, Sep. 13, 1976, abandoned. This application Feb. 6, 1979, Ser. No. 9,943
Claims priority, application France, Aug. 20, 1976, 76 25386
Int. Cl.[3] C07C *91/06;* A61K *7/12*
U.S. Cl. 8—410 19 Claims

1. A dyeing composition for keratinic fibers comprising an aqueous solution containing a dyeing amount of at least one dye compound having the formula:



in which R_1 is $—(CH_2)_n—OR$, R is methyl or ethyl, n is 2 or 3, or one of the corresponding acid salts.

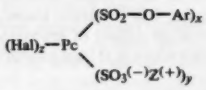
4,277,245

PROCESS FOR DYEING AND PRINTING CELLULOSE FIBRES

Manfred Groll, Cologne; Werner Kühnel, Leverkusen, and Robert Kuth, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,866
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909012
Int. Cl.[3] D06P *1/14, 3/60*
U.S. Cl. 8—532 3 Claims

1. In the dyeing and printing of cellulose fibers alone or admixed with other fibers by swelling said fibers with a water-miscible swelling agent, treating the swollen fibers with a dyestuff, and fixing the dyestuff by heat treatment, the improvement which comprises employing as said dyestuff a compound of the formula



wherein

Pc is the radical of a Cu phthalocyanine, Ni phthalocyanine or Co phthalocyanine molecule,

Ar is a phenyl or naphthyl radical which can be substituted by halogen, C_1–C_{12}-alkyl or C_1–C_4-alkoxy, which can in turn be further substituted by halogen, hydroxyl or C_1–C_4-alkoxy, nitro, acetyl, propionyl, benzoyl, carboxylic acid C_1–C_8-alkyl ester, carboxylic acid phenyl ester, carboxylic acid benzyl ester, C_1–C_4-alkylmercapto, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, amino-carbonyl or -sulphonyl, mono- or di-alkylamino-carbonyl or -sulphonyl with a total of 1–4 carbon atoms, urea, cyclohexyl or phenyl, it being possible for the last 3 substituents to be in turn substituted by the above-mentioned radicals,

$Z^{(+)}$ is a hydrogen ion, an alkali metal ion or an ammonium ion,

Hal is chlorine or bromine,

x is 2, 3 or 4,

y is 0 or 1,

$x+y \leqq 4$, and

z is 0, 1, 2, 3 or 4.

4,277,246

PROCESS FOR THE DYEING OF CELLULOSE FIBERS WITH REACTIVE DYES ACCORDING TO THE BATCHWISE EXHAUSTION METHOD

Armand Lehinant, Offenbach am Main; Joachim W. Lehmann, Kelkheim, and Hans-Peter Maier, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 64,778, Aug. 8, 1979, abandoned. This application Jun. 25, 1980, Ser. No. 163,202
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2835035
Int. Cl.[3] D06P *3/66*
U.S. Cl. 8—532 6 Claims

1. In a process for the dyeing of a textile consisting of or containing cellulose fibers, with one or more reactive dyes according to the batchwise exhaustion method, the improvement which comprises dyeing with an aqueous dye liquor containing one or more reactive dyes and at least one neutral electrolyte, the initial pH value of said dye liquor being in the slightly acid range, at a temperature in the range of from 110° to 140° C., without the addition of an alkali or alkali-yielding agent.

4,277,247

PROCESS FOR DYEING PRE-CLEANED CELLULOSE FIBER MATERIAL

Karlheinz Keller, Bettingen, and Lotti Furer, Biel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,270

Claims priority, application Switzerland, Jan. 10, 1979, 217/79

Int. Cl.[3] C09B *67/00*

U.S. Cl. 8—557 15 Claims

1. A process for dyeing pre-cleaned cellulose fibre material with vat dyes or anionic dyes, which comprises dyeing the cellulose material in the presence of a polypropylene oxide adduct, or a salt thereof, which adduct contains carboxyl groups and has been prepared from a mol ratio of

(a) about 1 mol of an aliphatic diol which has an average molecular weight of not more than 2,600;

(b) about 2 mols of an aliphatic dicarboxylic acid, or its anhydride, having 4 to 10 carbon atoms;

(c) about 1 mol of an adduct of propylene oxide with an aliphatic alcohol which is at least trihydric and has 3 to 10 carbon atoms; and

(d) about 1 to 2 mols of a fatty acid having 8 to 22 carbon atoms.

4,277,248

METHODS FOR THE DETECTION OF LOW LEVEL CONCENTRATIONS OF SULFONAMIDES

Modest Osadca, Passaic, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 22, 1979, Ser. No. 68,820

Int. Cl.[3] G01N *33/02, 31/22*

U.S. Cl. 23—230 M 6 Claims

1. A method for the determination of low levels of sulfonamides in poultry feeds which comprises.

(a) forming a thin layer of the feed on a filter paper substrate,

(b) placing a filter paper cover over the feed layer,

(c) uniformly wetting the resulting filter paper/feed unit with a spray of a chromogen solution comprising p-dimethylaminocinnamaldehyde in acidified methanol,

(d) applying a uniform pressure to the entire unit surface and

(e) visually observing any wine-red spots which develop on the filter paper cover to determine the presence of a sulfonamide in the poultry feed.

4,277,249

MAMMALIAN SOMATOMEDIN MEASUREMENT

Alan Broughton, Laguna Niguel, Calif., assignor to Nichols Institute, San Pedro, Calif.

Filed Oct. 15, 1979, Ser. No. 84,800

Int. Cl.[3] G01N *33/74*

U.S. Cl. 23—230 B 7 Claims

1. A method for determining levels of Somatomedin-C in biological fluid which comprises the steps of:

(a) collecting a specimen of biological fluid having an unknown content of Somatomedin-C by absorption on an absorbent medium;

(b) drying the absorbent medium;

(c) eluting the Somatomedin-C activity from the absorbent medium; and

(d) determining the Somatomedin-C activity of the eluate.

3. A method for suppressing exogenous generation of Somatomedin-C in biological fluid specimens, which comprises the steps of:

(a) collecting a fluid specimen having an unknown content of Somatomedin-C;

(b) absorbing the fluid on an absorbent medium;

(c) drying the medium.

4,277,250

METHODS FOR DETECTING AND QUANTIFYING OCCULT BLOOD

Joseph L. Melnick, and Craig Wallis, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Dec. 10, 1979, Ser. No. 101,722

Int. Cl.[3] G01N *33/72*

U.S. Cl. 23—230 B 19 Claims

1. A method for detecting occult blood in a human specimen which comprises:

(a) acidifying a liquid test sample of the specimen with an organic acid;

(b) separating the test sample into a liquid portion and a solid portion;

(c) passing the acidified liquid portion through an electronegatively charged membrane capable of adsorbing hemoglobin;

(d) thereafter, washing the membrane surface to remove residual test sample liquids;

(e) treating the washed surface with a peroxidase indicator composition suitable for detecting hemoglobin; and

(f) observing the color on the treated membrane surface.

4,277,251

METHOD AND DEVICE FOR DETERMINING THE ALCOHOL CONTENT OF A PERSON'S BREATHING

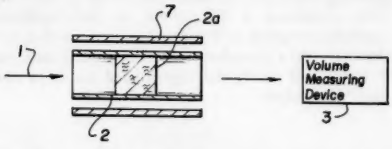
Kurt Leichnitz, Gross Gronau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 121,888

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1979, 2910778

Int. Cl.[3] G01N *27/62, 1/22*

U.S. Cl. 23—232 R 1 Claim



1. A method of determining the alcohol content of air, exhaled by a person, of the type in which a flow of the exhaled air is passed through a sample tube which has a silica gel therein for retaining the alcohol in the air, comprising cooling the sample tube and silica gel to a temperature of 0° to 5° C., directing exhaled air through the cooled tube and the alcohol retaining silica gel while measuring the air which passes through the sample tube to obtain a predetermined volume, and subsequently heating the sample tube and silica gel to a temperature of 150° to 200° C., and then directing a flushing air therethrough at a temperature of 150° to 200° C.

4,277,252

METHOD FOR PRODUCING AGGLOMERATES FROM FINELY DIVIDED CARBONACEOUS SOLIDS

Philip J. Dudt, Scenery Hill, Pa., assignor to Conoco, Inc., Stamford, Conn.

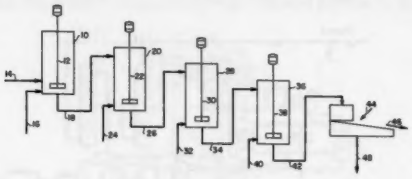
Continuation of Ser. No. 832,259, Sep. 12, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,241

Int. Cl.[3] B01D *21/01*

U.S. Cl. 23—313 R 10 Claims

1. In a method for producing agglomerate particles from an aqueous feed slurry containing from about 10 to about 40 weight percent solids, said solids comprising finely divided carbonaceous solids, clays and gangues by mixing said aqueous slurry containing said solids and oil in a first mixing zone to form a mixture and thereafter further mixing said mixture in at least one other mixing zone thereby forming said agglomerate

particles containing said carbonaceous solids and said oil which are thereafter separated from said clays and gangues,



the improvement consisting essentially of admixing an additional quantity of aqueous feed slurry containing said solids with said mixture in at least one of said other mixing zones.

4,277,253

GRANULATING AN AQUEOUS DISPERSION OF AMMONIUM AND POTASSIUM SALTS

Karl H. Walter, Henley South; John D. Johnston, Elizabeth Park, and Dennis Wetherley, Salisbury Park, all of Australia, assignors to Adelaide & Wallaroo Fertilizers Ltd., Adelaide, Australia

Filed Dec. 17, 1979, Ser. No. 104,068
Claims priority, application Australia, Dec. 22, 1978, PD7189
Int. Cl.[3] C05G *3/00;* **C05C** *7/02;* **C05D** *11/00*
U.S. Cl. 23—313 R **17 Claims**

1. A process for the preparation of dry, stable granular material from a salt selected from the group consisting of water-soluble potassium and ammonium salts selected from the group consisting of potassium sulfate, potassium chloride, ammonium sulfate and mixtures thereof, said process comprising the steps of:

(1) crushing the salt, dispersing said crushed salt in an aqueous liquid to produce a dispersion of salt crystals,

(2) subjecting said dispersion of crystals of at least one said salt in an aqueous liquid to the action of a granulating device in the presence of 0.5 to 10% w/w of calcium sulfate hemihydrate and 0.1 to 5% w/w of a hydrophilic surface active agent to effect agglomeration of said crystals, and

(3) drying the resultant agglomerated crystals to produce the dry, stable granular material, said percentages being with respect to said salt.

4,277,254

CONTROL SYSTEM AND APPARATUS FOR PRODUCING COMPATIBLE MIXTURES OF FUEL GASES

Robert C. Hanson, Excelsior, Minn., assignor to Energy Systems, Incorporated, Eden Prairie, Minn.

Filed Feb. 15, 1980, Ser. No. 121,796
Int. Cl.[3] F17D *3/01;* **C10K** *3/06*
U.S. Cl. 48—180 R **3 Claims**

1. An apparatus for mixing at least one stream of fuel gas under pressure in a first conduit with another stream of gas under pressure in a second conduit to create a resulting fuel gas mixture under pressure in a third conduit connected to said first and second conduits, said resulting mixture having a particular desired heating value equivalency, wherein said heating value equivalency is defined as the heating value of a gas divided by the square root of the specific gravity of that gas and where said heating value can be expressed as a function of the specifc gravity plus a constant; said apparatus including a control system comprising, in combination:

A. a first flow-varying means operatively connected to said first conduit for controlling the flow of gas through said first conduit;

B. a second flow-varying means operatively connected to said second conduit for controlling the flow of gas through said second conduit;

C. pressure sensing means operatively connected to said first conduit for developing a first signal representative of the pressure in said first conduit upstream of said first flow-varying means;

D. pressure sensing means operatively connected to said second conduit for developing a second signal representative of the pressure in said second conduit upstream of said second flow-varying means;

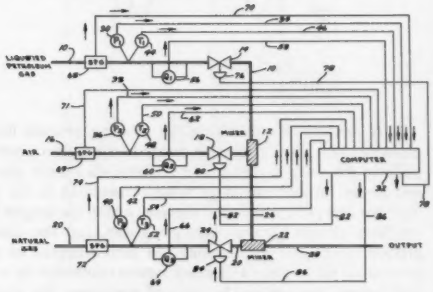
E. temperature sensing means operatively connected to said first conduit for developing a third signal representative of the temperature in said first conduit upstream of said first flow-varying means;

F. temperature sensing means operatively connected to said second conduit for developing a fourth signal representative of the temperature in said second conduit upstream of said second flow-varying means;

G. first fluid flow sensing means operatively connected to said first conduit for developing a fifth signal representative of the rate of flow of gas through said first conduit;

H. second fluid flow sensing means operatively connected to said second conduit for developing a sixth signal representative of the rate of flow of gas through said second conduit;

I. specific gravity sensing means operatively connected to said first conduit for developing a seventh signal representative of the specific gravity of the gas in said first conduit;



J. specific gravity sensing means operatively connected to said second conduit for developing an eighth signal representative of the specific gravity of the gas in said second conduit;

K. first signal computing means for developing a ninth signal representative of a particular desired heating value equivalency;

L. second signal computing means operatively connected for receiving said first, second, third, fourth, fifth, sixth, seventh and eighth signals, said second signal computing means developing a tenth signal representative of the heating value equivalency of the fuel gas mixture flowing in said third conduit;

M. comparator means, operatively connected for receiving said ninth and tenth signals, which compares the particular desired heating value equivalency represented by said ninth signal with the heating value equivalency of the gas flowing in said third conduit as represented by said tenth signal and generates first and second output signals; and

N. a first signal receiving means operatively connected to said comparator means to which said first output signal is transmitted from said comparator means and a second signal receiving means operatively connected to said comparator means to which said second output signal is transmitted from said comparator means, said first signal receiving means connected to said first flow varying means for controlling said first flow-varying means and said second signal receiving means connected to said

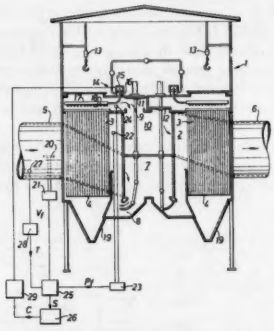
second flow varying means for controlling said second flow-varying means, whereby gas flow in said first and second conduits is varied to maintain the tenth signal equal to the ninth signal.

4,277,255

CLEANING PROCESS CONTROL METHOD FOR TEXTILE BARRIER FILTER MATERIAL

Roland G. Apelgren, Växjö, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

Filed Jan. 23, 1980, Ser. No. 114,951
Claims priority, application Sweden, Dec. 2, 1979, 7901881
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—20 **8 Claims**



1. A method of controlling the cleaning process for the cleaning of the filter material in textile barrier filters where the polluted gas is supplied to a filter chamber via a crude gas inlet and passes through the filter material mounted in the filter chamber and precipitates dust thereon, and is discharged from the filter chamber via a clean gas outlet, and the cleaning process is effected by exposing the filter material to compressed air pulses from a cleaning system controlled by a control system, comprising the steps of measuring the pressure drop p_f over the filter material, measuring the gas flow to determine the filter load v_f, which is the ratio between the gas flow and the filter area, computing the filter resistance S, which is the ratio between p_f and v_f, and comparing S with a nominal value So of filter resistance, and in response to deviation of S from So, emitting a control signal for controlling the operation of the cleaning system on the filter material.

4,277,256

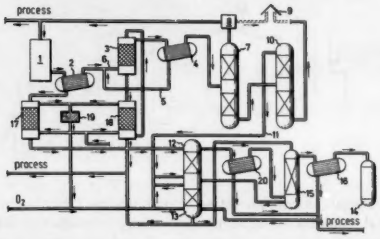
PROCESS FOR THE PURIFICATION OF GASES CONTAINING RADIOACTIVE SUBSTANCES

Hans Hesky, Runkel, and Armin Wunderer, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 886,519, Mar. 14, 1978, abandoned. This application Jul. 20, 1979, Ser. No. 59,132
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711374
Int. Cl.³ B01D *59/50*
U.S. Cl. 55—66 **8 Claims**

1. A process for purifying radioactive-substance-containing gases obtained in the processing of spent nuclear fuel, said gases comprising water vapor, nitrogen, nitric oxide, a higher nitrogen oxide, and vaporous nitric acid, which comprises

(a) washing said radioactive-substance-containing gases with nitric acid,



(b) separating the gas mixture obtained by the washing into a fraction containing radioactive substances and nitric oxide and a fraction free thereof, and

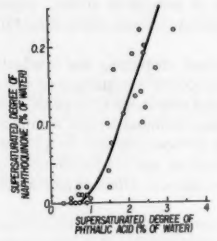
(c) separating nitric oxide from the radioactive substances.

4,277,257

PROCESS FOR PREVENTING SCALE DEPOSITION

Ryo Matsuura, Yamato; Katsumi Matsuzaki, and Masao Narita, both of Yokohama, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Nov. 19, 1979, Ser. No. 95,522
Claims priority, application Japan, Feb. 16, 1979, 54-17545
Int. Cl.³ B01D *47/00*
U.S. Cl. 55—85 **5 Claims**



1. In a process for preventing scale deposition in a water washing type collector and pipe line instruments thereof for collecting naphthoquinone and phthalic anhydride in an aqueous slurry from a gas obtained by a catalytic gas phase oxidation of naphthalene, the improvement characterized by adding fine crystals of phthalic acid to the aqueous slurry to decrease supersaturated degrees of phthalic acid and naphthoquinone in the liquid phase.

4,277,258

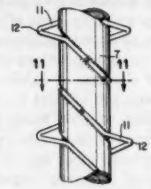
ELECTROSTATIC PRECIPITATOR AND DISCHARGE ELECTRODE THEREFOR

Erik M. Bojsen, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Dec. 7, 1978, Ser. No. 967,513
Claims priority, application United Kingdom, Dec. 9, 1977, 51322/77; Nov. 28, 1978, 42246/78
Int. Cl.³ B03C *3/41*
U.S. Cl. 55—152 **19 Claims**

1. A discharge electrode for ion emission in an electrostatic precipitator which comprises a generally rigid tubular member including at least one channel along the surface thereof, at least one wire member disposed within said at least one channel, said at least one wire member being selectively folded at spaced portions along said generally tubular member to form a

plurality of spaced apart, generally elongated protrusions having blunt ended portions, said protrusions extending outwardly therefrom and generally transverse to the axis of said member, at least one of said protrusions having a free end portion having



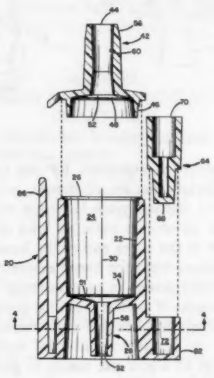
a generally rounded configuration, said protrusions being configured and spaced such that the dispersion of the electrostatic ion emission provided by said member is substantially uniform and substantially from the blunt ended portions of said protrusions.

4,277,259

AIR-SAMPLING CARTRIDGE

David P. Rounbehler, Concord, and Robert S. Potts, Sherborn, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Feb. 11, 1980, Ser. No. 120,401
Int. Cl.³ G01N *31/06*; B01D *47/00, 53/30*
U.S. Cl. 55—270 **4 Claims**



1. Apparatus for carrying an air-pervious packing of adsorbent material, and useful in combination therewith for collecting compounds from an air sample, comprising:

a cartridge body including a thin, nearly cylindrical wall defining a cavity for receiving a packing of adsorbent material, said body having a first end open for admitting said packing and a hollow elongated outlet opposite said first end and having an outlet port therein;

a cartridge cap having a hollow elongated inlet at one end thereof with an inlet port therein, said cap being sealably attachable to the first end of said cartridge body to form a cartridge;

said inlet having an inner surface of a shape similar to the outer surface of said outlet to permit series connection of said cartridge to a second cartridge identical thereto by insertion of the outlet of one of said cartridges into the inlet of the other of said cartridges;

retainer means in said cartridge body and said cartridge cap for, upon receipt of adsorbent material in said cavity, preventing the passage of adsorbent material through the outlet of said body and, after attachment of said cartridge cap to the body, through the inlet of said cap, said retainer means being porous to the flow of air and selected solvents therethrough; and

a pair of shipping caps removably attachable to said inlet and said outlet for blocking the inlet port and outlet port at selected times, said caps being storable in a pair of wells formed in said cartridge body outside said nearly cylindrical wall;

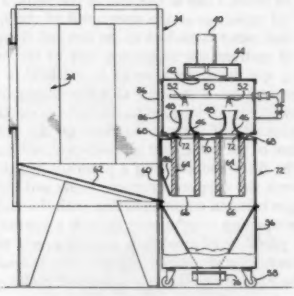
said outlet having an outer diameter appreciably smaller than the outer diameter of said inlet to avoid inadvertent connection of said outlet to a pump for air sampling.

4,277,260

POWDER COLLECTORS

Jesse H. Browning, 4217 Via Pinzon, Palos Verdes Estates, Calif. 90274

Filed Aug. 14, 1979, Ser. No. 66,412
Int. Cl.³ B01D *46/04*; B05B *15/04*
U.S. Cl. 55—273 **27 Claims**



1. A collector comprising:

a housing defining a first chamber having means for coupling to an exhaust duct, said housing including support structure and having therein at least one velocity stack means disposed adjacent a first chamber intake opening in said housing, said housing also having high pressure means for controllably directing a blast of air through said at least one velocity stack means and out said first chamber intake opening;

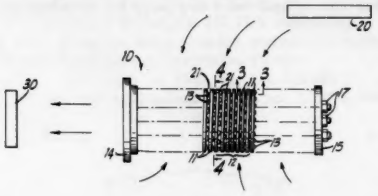
a collector assembly structurally independent of said housing and defining a second chamber having disposed therein at least one filter element which is structurally supported entirely by said collector assembly, said second chamber having a first opening for cooperating with a mating opening in a housing structure containing particulate laden air to be filtered, and at least one second opening adjacent said at least one filter element and cooperatively disposed with respect to said first chamber intake opening, so that air must pass through said at least one filter element to pass through said at least one second opening, said second chamber being mobile so as to be readily moveable with respect to said first chamber; and

a manually operable means for coupling said collector assembly to said first chamber and simultaneously therewith sealingly engaging said at least one filter element with said at least one first chamber intake opening for communication with said at least one velocity stack means.

4,277,261
REUSABLE HELICAL FILTER FOR HIGH TEMPERATURE GASES

Richard J. Miko, Paramus, N.J., and Daniel H. Shapiro, Roslyn Heights, N.Y., assignors to Edo Corporation, College Point, N.Y.

Filed Mar. 14, 1979, Ser. No. 20,483
Int. Cl.³ B01D *46/24, 46/40*
U.S. Cl. 55—278 **8 Claims**

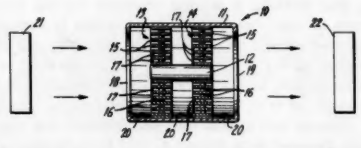


1. A hot gas filter to remove contaminants from a gas stream generated by a burning propellant and having a gas temperature in excess of 4500° F., the filter to be capable of surviving numerous exposures to the hot gas without damage and to be used in a system between the burning propellant and a movable member downstream of the filter to reliably prevent fouling of the downstream member after numerous exposures to the hot gas, said filter comprising: a metal strip wound into a helix with a plurality of turns; a cap at one end of the helix; a flange with a plurality of openings at the other end of the helix; axially extending stud means attached to the cap and flange to axially position and restrain the helix; one side of the helical metal strip having spaced protuberances to establish a spacing between adjacent turns of the helix to define filter gaps; a support structure having walls internal to the helix in contact with the helix at a plurality of portions to maintain the cross-sectional configuration of the helix, said support structure extending the length of the filter and defining a plurality of axial flow passages between the support structure walls and the helix, said flow passages being in communication with the said filter gaps; each flange opening overlapping at least a portion of at least one of the plurality of axial flow passages; and the strip and support structure being comprised of a metal capable of withstanding the high temperature gas without melting.

4,277,262
REUSABLE AXIAL FILTER FOR HIGH TEMPERATURE GASES

Richard J. Miko, Paramus, N.J., and Daniel H. Shapiro, Roslyn Heights, N.Y., assignors to Edo Corporation, College Point, N.Y.

Filed Mar. 14, 1979, Ser. No. 20,484
Int. Cl.³ B01D *46/40*
U.S. Cl. 55—278 **7 Claims**

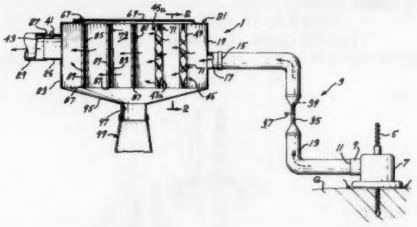


1. A hot gas filter to remove contaminants from a gas stream generated by a burning propellant and having a gas temperature in excess of 4500° F., the filter to be capable of surviving numerous exposures to the hot gas without damage and to be used in a system between the burning propellant and a movable member downstream of the filter to reliably prevent fouling of the downstream member after numerous exposures to the hot gas, said filter comprising: an essentially cylindrical metal casing with entrance and exit ends; a centrally-located metal plug within the casing; at least one flat spiral element formed by a flat metal strip wound about the plug to form a plurality of turns in the spiral, the outer circumference of said spiral being radially positioned and restrained by said casing; one side of the spiral metal strip having spaced protuberances to establish a spacing between adjacent turns of the spiral to define filter gaps; a plurality of metal spacing supports extending axially and across the casing at positions within the casing not occupied by the spiral element, to axially position the spiral element within the casing and support the peripheral shape of the casing; each spacing support being a convoluted strip which contacts the interior surface of the casing at a number of points along the convoluted strip; and the strip and spacing supports being comprised of a metal capable of withstanding the high temperature gas without melting.

4,277,263
AIR AND ROCK PARTICLE SEPARATOR WITH SPIRAL DEFLECTORS

Willard Bergeron, 478 Surprenant St., Drummondville, Quebec, Canada (J2C 4J3)

Filed Mar. 26, 1979, Ser. No. 23,738
Int. Cl.³ B01D *39/10*
U.S. Cl. 55—282 **6 Claims**



1. An air borne rock separator for use in separating the heavier rock material from an air stream carrying heavy and light rock material, the separator having a housing defining a generally straight air stream path, an inlet at one end of the housing, an outlet at the other end of the housing, at least one set of spirally twisted deflector bands extending across the air stream path in a plane generally perpendicular to the air stream path, the bands made of material strong enough to normally intercept and deflect the heavier rock material, at least the outer portion of the bands composed of resilient material of sufficient thickness to allow the bands to give slightly when struck by heavier rock material so as to increase their operational life, and including at least one screen mounted in the housing extending across said air stream path downstream from said deflector bands.

4,277,264
FILTER CLEANING ARRANGEMENT

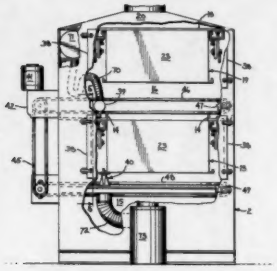
Kenneth M. Buchholz, Shorewood, Wis., and Henry T. Le Maire, Prairie View, Ill., assignors to Schomann, Inc., Milwaukee, Wis.

Filed Dec. 26, 1979, Ser. No. 107,343
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—294 **1 Claim**

1. For a filter comprising a lengthwise series of transverse pleats and disposed in a housing to divide the housing into an inlet dust chamber and an outlet clean air chamber,

a cleaning arrangement comprising: a blower; a blower head that is disposed in the outlet clean air chamber, said blower head defining a substantially continuous blower slot that faces and extends substantially entirely across the filter parallel to the pleats and that has a width substantially equal to the width of one pleat; a single suction

source; a suction head disposed in the inlet dust chamber, said suction head defining a pair of axially aligned suction slots that face and together extend substantially entirely across the filter, and that are parallel to and in alignment with the blower slot, each suction slot extending substantially halfway across the filter and having a width substantially equal to the width of one pleat; means to move the



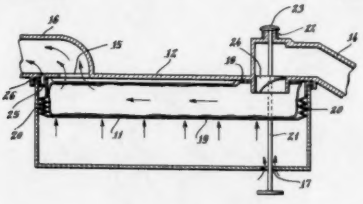
blower and suction heads back and forth in tandem along the length of the filter; means to connect the blower to the blower slot so that the blower slot is operative as the heads move in both directions; and means to alternately connect the separate suction slots to the suction source so that one suction slot is operative when the heads move in one direction and the other suction slot is operative when the heads move in the other direction.

4,277,265

COMPRESSING ARRANGEMENT FOR A DUST CONTAINER

Karl E. Leinfelt, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Oct. 19, 1979, Ser. No. 86,353
Claims priority, application Sweden, Oct. 19, 1978, 7810881
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—302 **9 Claims**



1. A compressing arrangement for a flexible filter-type dust container of the type used with a vacuum cleaner, a motor-fan assembly, a hand-held working implement and suction hose comprising: a chamber having an inlet for dust and dirt laden air, said filter dust container positioned in said chamber and connected to said inlet, an outlet for air substantially devoid of dirt and dust, said motor-fan assembly transporting said air from said work implement through said suction hose inlet, and said dust container whereby said dust and dirt are separated in said container and cleaned air leaves said chamber through said outlet, a substantially flexible body at least partially surrounding said container, and means selectively and operatively connected to said chamber for permitting the introduction of atmospheric pressure conditions between the interior of said chamber and the outside of said dust container to thereby compress said container with the aid of said air-impermeable body whereby the inner volume of the dust container during a certain period of time becomes smaller than the original volume of said container and alternately to maintain suction conditions within said container.

4,277,266

ULTRA FILTRATION UNIT COMPRISING A TUBULAR FILTER ELEMENT

Gordon A. Dick, Bethany, Canada, assignor to Wheelabrator Corporation of Canada Limited, Ontario, Canada

Filed Feb. 27, 1980, Ser. No. 125,113
Int. Cl.³ B01D *46/04, 50/00*
U.S. Cl. 55—381 **13 Claims**

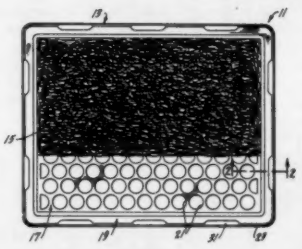
1. In an ultra filtration unit comprising an inlet and an outlet for the flow of gas therethrough, a filter element comprising a tubular wall of cloth napped on its internal surface and having a layer of filter aid material deposited thereon so as to penetrate the nap, said filter element having a hollow interior in communication with said inlet and an exterior in communication with said outlet such that said gas flowing through said ultra filtration unit passes through said cloth wall and said layer of filter aid material to be filtered thereby.

4,277,267

AIR FILTER ASSEMBLY

Howard L. Posner, Highland Park, Ill., assignor to Perfect Filter Corporation, Northbrook, Ill., a part interest

Filed Dec. 17, 1979, Ser. No. 104,543
Int. Cl.³ B01D *46/10*
U.S. Cl. 55—494 **4 Claims**



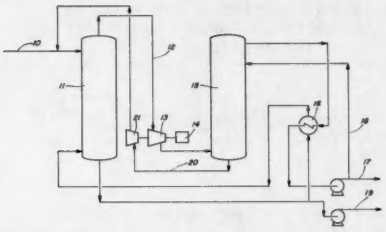
1. An air filter assembly including,
a molded rectangular frame having a filter element supporting and backing portion and an integral peripheral flange portion,
the filter element supporting and backing portion being generally planar and having a plurality of discrete apertures formed therein in a pattern to permit air flow therethrough,
the flange portion having a channel shaped cross-section defined by an inner, an outer and connecting walls with the inner wall attached to the filter element supporting and backing portion,
the inner and outer walls of the flange portion sloping towards each other in the direction away from the filter element supporting and backing portion so that one frame can be nested in another, and
a filter element mounted on and attached to the filter element supporting and backing portion on the flange portion side of the frame.

4,277,268

HEAT PUMP FRACTIONATION PROCESS

Carl D. Spangler, Jr., Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Oct. 17, 1979, Ser. No. 85,825
Int. Cl.³ B01D 3/14
U.S. Cl. 62—26 **4 Claims**



4. A process for separating chemical compounds having different boiling points in a fractionating unit including a stripping section below the feed point and a rectifying section above the feed point which comprises the steps of:

(a) passing a feed stream comprising a first and a second chemical compound into the fractionating unit;
(b) maintaining the stripping section at a first temperature and pressure;
(c) withdrawing an overhead vapor stream from the stripping section;
(d) compressing only said overhead vapor stream to increase its pressure and temperature in a single heat pump compressor;
(e) passing the compressed stream directly to the rectifying section;
(f) maintaining the rectifying section at a higher temperature and pressure than the stripping section;
(g) withdrawing a liquid stream from the bottom of the rectifying section and returning it to the stripping section;
(h) withdrawing an overhead vapor stream rich in said second compound from the rectifying section;
(i) withdrawing a liquid stream rich in said first compound from the bottom of the stripping section;
(j) passing a portion of the liquid stream from the bottom of the stripping section in heat exchange relationship with at least a portion of the overhead vapor stream from the rectifying section whereby the liquid is heated and at least part of the vapor is condensed;
(k) returning the heated liquid stream to the bottom of the stripping section to provide reboiler heat;
(l) recovering the remainder of the liquid stream from the bottom of the stripping section as product;
(m) returning a portion of the condensed vapor from step (j) to the top of the rectifying section as reflux; and
(n) recovering the remainder of the condensed vapor from step (j) as product.

4,277,269

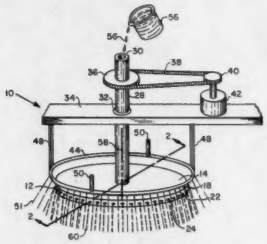
PROCESS FOR THE MANUFACTURE OF CERAMIC OXIDE FIBERS FROM SOLVENT SOLUTION

Truett B. Sweeting, Youngstown, N.Y., assignor to Kennecott Corporation, Stamford, Conn.

Filed Dec. 19, 1979, Ser. No. 105,319
Int. Cl.³ C03B 37/02, 37/04
U.S. Cl. 65—2 **20 Claims**

1. A process for manufacturing ceramic oxide fibers having an average diameter of less than 5 microns from a solvent solution of an oxide precursor soluble in the solvent, said solution having a viscosity of from about 100 to 450 poises which process comprises:

(a) introducing said solution into a spinning device comprising a hollow rotatable disc having a circumferential edge providing with a series of openings having a diameter of from about 0.3 to about 1.5 millimeters;
(b) rotating said hollow disc at a sufficient angular velocity to provide sufficient pressure of said solution against the interior of said edge to force said solution through said openings in a fiber form;



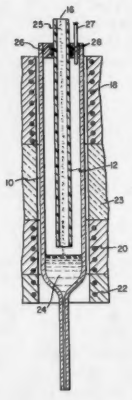
(c) attenuating said fibers to a diameter of less than 10 microns with a continuous stream of air; and
(d) heating the fibers in an oxygen atmosphere to a sufficient temperature to form ceramic oxide fibers having a diameter of less than 5 microns.

4,277,270

METHOD OF MANUFACTURE OF OPTICAL FIBER

David A. Krohn, Hamden, Conn., assignor to Eotec Corporation, West Haven, Conn.

Continuation-in-part of Ser. No. 898,840, Apr. 21, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 53,764
Int. Cl.³ C03C 25/02
U.S. Cl. 65—3 A **5 Claims**



1. A process for making a low loss optical fiber having a numerical aperture in excess of about 0.4 and comprising a multi-component glass core within a cladding material, including the steps of:

melting a glass core composition with a tube made of a high-purity fused silica, said core glass composition comprising by weight 27% to 42% silicon dioxide, 7% to 50% boron oxide, 5% to 51% of an oxide selected from the group consisting of lead oxide and barium oxide, and 5% to 30% of an alkali oxide selected from the group consisting of lithium oxide, sodium oxide and potassium oxide;
fining the melted core glass within said glass tube at a temperature substantially in excess of the melting temperature

of said glass core composition to enable uniform mixing of said core glass and silica; and

drawing said tube and core glass into said optical fiber.

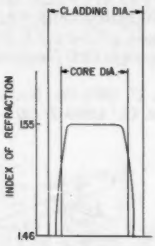
4,277,271
METHOD OF MANUFACTURING GRADED INDEX OPTICAL FIBERS

David A. Krohn, Hamden, Conn., assignor to Eotec Corporation, West Haven, Conn.

Continuation-in-part of Ser. No. 898,840, Apr. 12, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 53,765

Int. Cl.³ C03C *25/02*

U.S. Cl. 65—3 A **10 Claims**



1. A process for making graded optical fibers, comprising

providing a glass tube made of a cladding material closed at one end and having a first index of refraction;

inserting into said glass tube a material from which a core glass having a second index of refraction higher than said first index is to be formed, said material being capable of reacting with said cladding material above a predetermined temperature substantially higher than the melting temperature of said material;

melting said material to form a glassy liquid at the closed end of said tube;

maintaining the temperature of said glassy liquid at the closed end of said tube;

maintaining the temperature of said glassy liquid above said predetermined temperature until a substantial portion of the inner wall of said tube has mixed with said glassy liquid; and

drawing said glassy liquid into said optical fiber comprising a cladding made of said glass tube and a core made of said glassy liquid with an index of refraction in the portion of the fiber which includes the cladding material mixed with the core glass intermediate said first and second indices.

4,277,272
METHOD FOR THE MANUFACTURE OF A MULTI-CHANNEL FIBER OPTICAL WAVEGUIDE

Hartmut Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,609

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909390

Int. Cl.³ C03B *37/075*

U.S. Cl. 65—3 A **6 Claims**

1. A method for the manufacture of a multi-channel fiber optical wave guide having several fiber optical wave guide cores embedded in a fiber optical wave guide cladding material, the method comprising providing a quartz glass tube having an interior surface, providing a cladding layer on the interior surface of the glass tube, applying a core glass layer on the cladding layer, removing a number of strips of the core glass layer to form a plurality of strips of the core glass, each of the strips of the core glass being distributed symmetrically on the circumference of the layer of cladding material and extending parallel to the axis of the glass tube, and then heating the glass tube to such an extent that it collapses into a rod shaped preform with each of the strips of the core material forming core preforms surrounded with cladding material, and then subsequently drawing the preform into a said fiber.

3. A method according to claim 1, wherein the steps of removing strips of the core glass layer comprises removing the strips by means of a gas phase etching process.

4,277,273
TREATMENT AND HANDLING OF METALLURGICAL SLAG

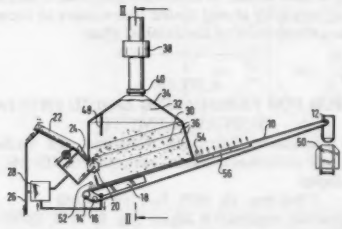
Edouard Legille, 165, rte de Treves, Luxembourg, and Carlo Heinz, rue du Bois, Niederanven, both of Luxembourg

Continuation of Ser. No. 840,219, Oct. 7, 1977, abandoned. This application Jun. 22, 1979, Ser. No. 51,456

Claims priority, application Luxembourg, Oct. 12, 1976, 75978; Sep. 26, 1977, 78184

Int. Cl.³ C03B *37/00*

U.S. Cl. 65—19 **17 Claims**



1. An installation for the treatment and handling of metallurgical slag to produce, either separately or simultaneously, granulated slag, expanded slag and/or mineral wool and automatically collecting said products, and having means for the disintegration by mechanical impacts of a flow of pyroplastic slag and cooling means for the cooling of the particles of slag formed by the disintegation, said installation comprising at least one perforated endless band positioned in the path of fall of the particles of slag which are projected by said disintegration means and rotating substantially in a direction parallel to the path of projection of said particles and the particles are cooled by said cooling means, an insulating enclosure positioned immediately above said perforated band, a section of the lower part of said enclosure being trapezoidal in shape, decreasing in size in the direction of said perforated band, and having one or more air admission slits, said insulating enclosure containing said disintegration and cooling means and means for trapping the ascending gaseous and/or solid by-product of the slag, said means for trapping said solid being mounted in the upper portion of said enclosure and comprising an endless rotary filter rotating about two cylinders positioned outside the enclosure, a scraper to detach said solid from said filter and a reservoir to collect said detached solid.

4,277,274
PROCESS FOR CONTROLLING MOLTEN GLASS VARIABLES

Max G. Chrisman, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

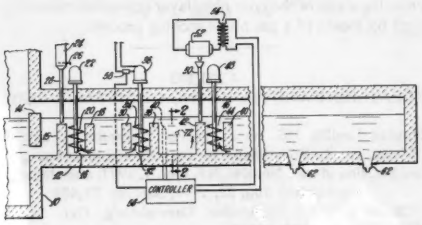
Filed Dec. 27, 1977, Ser. No. 864,559

Int. Cl.³ C03B *5/24*

U.S. Cl. 65—29 **6 Claims**

1. An accurate method of making a desired glass composition comprising: preparing a molten host glass that is purposefully deficient in one or more elements by a generally predetermined amount; preparing an additive that contains the deficient amount of said element; adding a first stream comprising a major amount of the additive at a predetermined rate to a

stream of the molten host glass; mixing the additive and host glass to form an intermediate glass; sensing the temperature and the viscosity or resistivity of the intermediate glass; adding a second stream comprising the balance of the aditive to the



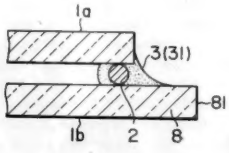
intermediate glass; mixing the second stream of additive and intermediate glass to form a finished glass; and controlling the flow of the second stream of additive in response to said sensed viscosity or resistivity at said sensed temperature to accurately control the composition of the finished glass.

4,277,275

METHOD FOR FABRICATING LIQUID CRYSTAL DISPLAY ELEMENT

Hiromitsu Kawamura; Tokuyoshi Nakajima, and Yoshimichi Shibuya, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1979, Ser. No. 74,148
Claims priority, application Japan, Sep. 8, 1978, 53-109640
Int. Cl.[3] C03C *27/00*
U.S. Cl. 65—43 **17 Claims**



1. A method for fabricating a liquid crystal display element having a first substrate, a second substrate arranged facing the first substrate, and a sealing material disposed at peripheral portions of the substrates with at least a part thereof being interposed between the substrates, for maintaining a predetermined spacing between the substrates and forming a hermetically sealed envelope together with the substrates, said method comprising the steps of:

preparing said first and second substrates, each having a plan surface of a predetermined shape with a peripheral edge, and at least one of said substrates having at least one specific portion extending outwardly beyond the peripheral edge of the other substrate when the substrates are assembled, said specific portion having a peripheral edge with a substantial length;

forming an electrode having a predetermined pattern on the surface of each of the substrate;

forming, on at least one of the surfaces provided with the electrodes of the substrates, a sealing material layer having a predetermined width and height and extending along the peripheral edges of the substrates, said sealing material layer including a specific section extending along the peripheral edge of said specific portion, said specific section being formed on the substrate having said specific portion;

disposing the substrates one above the other through the sealing material layer in a predetermined relative position, with the surfaces provided with the electrodes facing each other, and with the peripheral edge of one of the substrates corresponding to the peripheral edge of the specific portion of the other substrate being positioned within the range of said predetermined width of said specific section of the sealing material layer, to form a substrate assembly;

heating said substrate assembly to cause the sealing material layer to extend over a portion of the peripheral edge of the other substrate and to extend to a position not beyond the peripheral edge of the one substrate; and

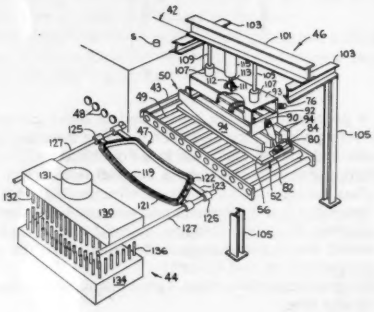
injecting liquid crystal into a space defined by the substrates and the sealing material layer.

4,277,276

METHOD AND APPARATUS FOR SHAPING GLASS SHEETS USING DEFORMABLE VACUUM MOLD

John D. Kellar, Pontypool, and Gordon F. Pereman, Columbus, both of Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 17, 1980, Ser. No. 130,783
Int. Cl.[3] C03B *21/00*
U.S. Cl. 65—106 **9 Claims**



1. A method of shaping a glass sheet comprising:

(a) delivering a heat-softened flat glass sheet to a shaping station into a position of alignment beneath a deformable vacuum mold having a downwardly facing, apertured, shaping surface capable of defining a flat configuration or a selected curved configuration and of deforming between said flat configuration and said curved configuration,

(b) engaging said flat glass sheet while the latter is heat-softened with said deformable vacuum mold by applying vacuum therethrough while said apertured shaping surface defines said flat configuration, and

(c) continuing to engage said heat softened glass sheet and to apply vacuum while deforming said shaping surface from said flat configuration to said curved configuration until said glass sheet changes shape to become a bent glass sheet whose shape conforms approximately to said curved configuration.

6. Apparatus for shaping a flat glass sheet comprising:

(a) means to heat said glass sheet to the glass deformation temperature,

(b) means to deliver said flat glass sheet in a heat-softened state to a predetermined position at a shaping station,

(c) a deformable vacuum mold comprising a deformable box having a downwardly facing, apertured shaping surface capable of deforming between a flat configuration and a curved configuration,

(d) means for applying vacuum to said box, and

(e) means operatively connected to said box to deform said downwardly facing, apertured shaping surface,

whereby on arrival of a glass sheet at said shaping station, said deformable vacuum mold is closely adjacent to the upper surface of said flat glass sheet with said apertured

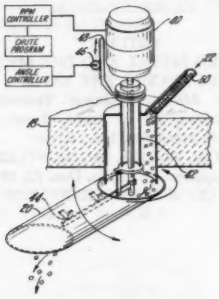
shaping surface defining said flat configuration, said means for applying vacuum applies a vacuum to said box to engage said flat glass sheet against said downwardly facing shaping surface while the latter is in said flat configuration and said means to deform said downwardly facing shaping surface deforms said box to said curved configuration while said vacuum applying means continues to apply vacuum to said box, thereby shaping said flat glass sheet to a bent glass sheet having a curved configuration conforming to said curved configuration.

4,277,277

FEEDING AGGLOMERATES TO A GLASS MELTING FURNACE

Mark A. Propster, Gahanna, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 29, 1979, Ser. No. 98,571
Int. Cl.³ C03B 5/18
U.S. Cl. 65—134 18 Claims



1. A furnace for the continuous production of molten glass comprising:

an enclosure for holding a volume of molten glass provided with an inlet opening at a crown wall through which glass batch agglomerates or raw glass batch may be introduced onto the molten glass and a longitudinally displaced outlet opening through which molten glass may be withdrawn;

means for supplying heat to said enclosure for melting the agglomerates or raw batch;

a rotary chute wherein the rotary chute extends through said inlet opening through which the agglomerates or raw batch may be introduced onto the molten glass;

means for varying the angle of the chute; and

means for rotating the chute at varying speeds.

4,277,278

HERBICIDAL AGENTS BASED ON ACETANILIDES

Karl Eicken, Wachenheim, and Bruno Wuerzer, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 56,146
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832046
Int. Cl.³ A01N 43/56
U.S. Cl. 71—92 3 Claims

1. A herbicidal agent which comprises a mixture of I 2-chloro-2',6'-dimethyl-N-(pyrazol-1-yl-methyl)acetanilide and II 2-chloro-2',6'-diethyl-N-methoxymethylacetanilide and wherein the ratio of I to II is from 1:1 to 1:6.

2. A herbicidal agent which comprises a mixture of I 2-chloro-2',6'-dimethyl-N-(pyrazol-1-yl-methyl)acetanilide and II 2-chloro-2'-ethyl-6'-methyl-N-(1'-methoxyprop-2'-yl)acetanilide and wherein the ratio of I to II is from 1:1 to 1:8.

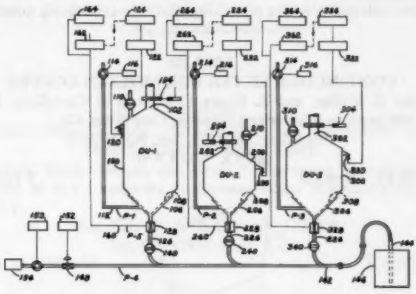
3. A herbicidal agent which comprises a mixture of I 2-chloro-2',6'-dimethyl-N-(pyrazol-1-yl-methyl)acetanilide and II 2-chloro-N-isopropylacetanilide and wherein the ratio of I to II is from 1:4 to 1:8.

4,277,279

METHOD AND APPARATUS FOR DISPENSING A FLUIDIZED STREAM OF PARTICULATE MATERIAL

Richard G. Kerlin, Aliquippa; Henry T. Kossler; Peter J. Koros, both of Pittsburgh, all of Pa., and Robert G. Petrushka, Parma, Ohio, assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1980, Ser. No. 132,968
Int. Cl.³ C21C 7/02
U.S. Cl. 75—58 20 Claims



1. The method of dispensing fluidized particulate materials from a plurality of holding vessels, which comprises:

(1) dispensing a first fluidized material from a first vessel through a first passage from said first vessel to a transport line;

(2) dispensing a second fluidized material from a second vessel through a second passage from said second vessel to said transport line for blending with said first material; and

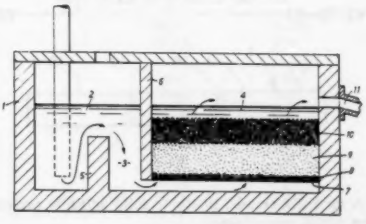
(3) controlling the flow rates of each said materials by selectively varying a portion of the cross-sectional area of the respective one of said first and second passages through which the material flows, the flow rate through each said passage being controllable independently of the flow rate through the other of said passages.

4,277,280

APPARATUS AND METHOD FOR REMOVAL OF ALKALI AND ALKALINE EARTH METALS FROM MOLTEN ALUMINIUM

Luc Montgrain, Arvida, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Aug. 14, 1979, Ser. No. 66,379
Claims priority, application United Kingdom, Aug. 23, 1978, 34381/78
Int. Cl.³ C22B 9/02
U.S. Cl. 75—68 R 19 Claims



1. A method for treating molten Al metal to reduce its con-

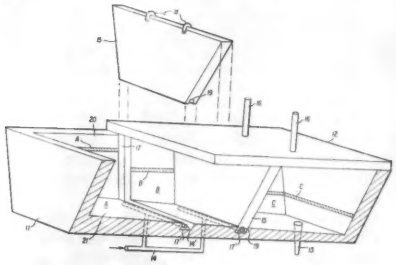
tents of alkali metal and alkaline earth metal impurities which comprises maintaining a bed of reactive particulate aluminium fluoride-containing material submerged in a body of molten aluminium, said aluminium fluoride-containing material having a melting point above the temperature of said molten aluminium and being maintained submerged irrespective of positive flow or zero flow of molten aluminium through said bed of particulate material, passing a stream of molten aluminium upwardly through said bed for reaction of its alkali metal and alkaline earth metal content with said reactive aluminium fluoride-containing material and passing the stream of molten aluminium, emerging from said bed, through a downstream layer of particulate refractory filter material, said layer of particulate refractory material being inert to molten aluminium and wettable by fluoaluminates formed by reaction of alkali metal and alkaline earth metal impurities in said molten aluminium with said reactive aluminium fluoride-containing material.

4,277,281

CONTINUOUS FILTER FOR MOLTEN COPPER

John G. Weber, and E. Henry Chia, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Aug. 16, 1979, Ser. No. 67,079
Int. Cl.³ C22B *9/02*
U.S. Cl. 75—93 R **5 Claims**



1. A method for purificatory filtration of molten copper, comprising:

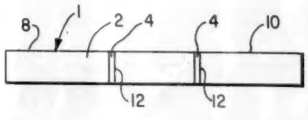
flowing a stream of molten copper through a ceramic foam filter initially comprising aluminum oxide and phosphate and being adsorptive of iron and calcium in the presence of molten copper, to substantially remove entrained inclusions and to substantially reduce the concentration of dissolved iron and calcium impurities.

4,277,282

METHOD OF MELT DISPERSING A FLOATABLE SOLID ADDITIVE IN MOLTEN METAL AND A MELT DISPERSIBLE, FLOATABLE, SOLID ADDITIVE THEREFOR

Roderick I. L. Guthrie, 35 Windsor Ave., Westmount, Quebec, and Frank Mucciardi, Montreal, both of Canada, assignors to Roderick I. L. Guthrie, Westmount, Canada

Filed Mar. 24, 1980, Ser. No. 132,972
Int. Cl.³ C22B *9/10*; C21C *7/00*
U.S. Cl. 75—53 **12 Claims**



1. A melt dispersible, floatable solid additive projectile for molten metal, comprising:

a solid elongated body of the additive having a resist on a minor portion of a surface of the solid body with the remaining surface area of the solid body exposed for direct contact with the molten metal, the resist providing insulation between said body and said molten metal whereby a shell frozen from molten metal onto said body includes a region of retarded shell development corresponding to said resist.

9. A method of melt dispersing a floatable, solid additive projectile in a molten metal ball, comprising:

(a) providing a resist on a surface of projectile to form local insulation between said projectile and said body, with the remaining surface area of the projectile exposed for direct contact with the molten metal,

(b) projecting said projectile with said resist below the surface of molten metal ball,

(c) permitting the formation of a frozen ball material shell to encase said projectile, the formation of said shell being retarded in the region of said resist,

(d) melting at least a portion of the additive encased within the shell thereby forming an outlet from said shell in the region of said resist,

(e) employing molten additive from said outlet, and

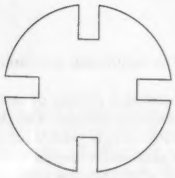
(f) remelting the shell

4,277,283

SINTERED HARD METAL AND THE METHOD FOR PRODUCING THE SAME

Masaaki Tobioka; Mitsuo Kodama; Tsuyoshi Asai, and Takaharu Yamamoto, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Dec. 19, 1978, Ser. No. 971,829
Claims priority, application Japan, Dec. 23, 1977, 52-156303
Int. Cl.³ B22F *3/00*; C22C *29/00*
U.S. Cl. 75—238 **12 Claims**



1. A sintered hard metal which comprises:

a core portion having a phase represented by the molecular formula $(M_A, M'_B, M''_C)(C_U, N_V)_X$ and having a B-1 type crystal structure containing W as one of the constituent elements thereof, and a WC phase in an amount of at least 50% by weight of the total sintered hard metal content, for hardness, and iron group metals for bonding, and

a surface portion of 5 to 200μ thickness wherein the proportion of the phases having the aforesaid B-1 type crystal structure is lower than that in the core portion in which:

M consists of Group IVa metallic elements, M′ consists of Group Va metallic elements, M″ consists of Group VIa metallic elements, C represents carbon, N represents nitrogen, the suffixes A, B, C, U and V represent the atomic ratios respectively, X represents the ratio of non-metallic constituent elements to the metallic constituent elements and said metal having the following relationships:

$$A + B + C = 1\ 1 \geqq A \geqq 0,\ 1 \geqq B \geqq 0,\ 1 \geqq C \geqq 0\ U + V = 1$$
$$10.0 \geqq 4A + 5B + 6C + X(4U + 5V) \geqq 8.4$$

7. A method for producing a sintered hard metal wherein a composite carbonitride represented by the molecular formula $(M_A, M'_B, M''_C)(C_U, N_V)_X$ and having B-1 type crystal structure containing W as one of the constituent elements thereof, WC in an amount of above 50% by weight of the total amount

of the sintered hard metal, and iron group metals, are mixed and then are pressed into a predetermined shape to form a green compact which is then sintered in a vacuum of less than 1 Torr at a temperature 1300° C. 1500° C.

4,277,284

SINGLE-PACKAGE ZINC-RICH COATINGS

Thomas Ginsberg, Piscataway, and Lawrence G. Kaufman, Somerville, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

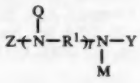
Continuation-in-part of Ser. No. 900,884, Apr. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 796,710, May 13, 1977, abandoned. This application Jun. 4, 1980, Ser. No. 153,731

Int. Cl.³ C09D *5/10*

U.S. Cl. 106—1.05 **15 Claims**

1. A stable single-package composition for protecting ferrous metals from corrosion consisting essentially of particulate zinc, an unhydrolyzed organic silicate or an organic silicate hydrolyzed up to 40% and a hardening amount of about 5 to about 50% based on the weight of organic silicate of hydrolyzable silicon compound selected from the class consisting of

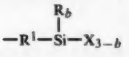
(a) amino silanes of the formula



wherein:

t is an integer having values of 0 to 10;

each of M, Y, Q and Z are R or

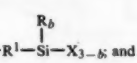


R is H, alkyl having 1 to 4 carbon atoms or hydroxyalkyl having 2 to 3 carbon atoms;

R^1 is $-C_2H_4-$, $-C_3H_6-$ or $-R^2-O-R^2-$ and

R^2 is an alkylene radical having about 1 to 8 carbon atoms;

b is an integer having values of 0 to 2; with the proviso that at least one of M, Q, Y or Z is



X is a hydrolyzable organic group;

(b) quaternary ammonium salts of the amino silanes in (a); and

(c) the hydrolyzates and condensates of the amino silanes in (a).

4,277,285

SEALING GLASS WITH HIGH COEFFICIENT OF ABSORPTION FOR INFRA-RED RAYS

Jean E. Boudot; Francoise M. M. Roger, both of Avon, and Michel P. H. Jeanmaire, Souppes-sur-Loing, all of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 7, 1980, Ser. No. 109,972

Claims priority, application France, Jan. 12, 1979, 79 00747

Int. Cl.³ C03C *3/04, 3/10*

U.S. Cl. 106—52 **1 Claim**

1. A sealing glass exhibiting a coefficient of absorption of infra-red rays within the range 0.7–4 microns of at least 98%, a viscosity at the liquidus temperature greater than 30,000 poises, an average coefficient of thermal expansion between 20°–300° C. of 91.1×10^{-7}/°C., and a volatilization of 95 ppm at the sealing temperature, said glass being essentially free from K_2O and B_2O_3 and consisting essentially, in weight percent on the oxide basis as calculated from the batch, of:

SiO_2	71.02
Al_2O_3	4.45
F	0.14
Li_2O	2.41
Na_2O	13.01
BaO	3.8
Fe_2O_3	3.47
TiO_2	1.00
ZrO_2	0.70

4,277,286

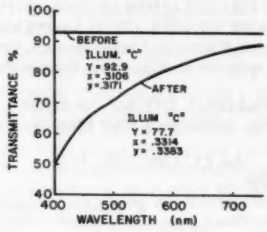
LEAD-FREE GLASSES OF HIGH X-RAY ABSORPTION FOR CATHODE RAY TUBES

David C. Boyd, Corning, and David A. Thompson, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,505

Int. Cl.³ C03C *3/10, 3/24*

U.S. Cl. 106—52 **3 Claims**



1. A glass for the faceplate of a television picture tube essentially free from PbO and other readily-reducible metal oxides exhibiting an electrical resistivity, when measured at 350° C., of at least 10^7 ohm-cm, a coefficient of thermal expansion (0°–300° C.) not in excess of 102×10^{-7}/°C., an internal liquidus under 900° C., a strain point not over 500° C., a softening point not over 690° C., a linear X-ray absorption coefficient at 0.6 Å of at least 35 cm^{-1} such that X-ray transmittance therethrough will be less than 0.5 mr/hr when measured at a distance of 5 cm from a faceplate of conventional thickness, and strong resistance of discoloration from X-ray and electron bombardment consisting essentially, expressed in weight percent on the oxide basis as calculated from the batch, of:

	SiO_2	43–55
	Al_2O_3	0–4
	ZnO	5–12
	Li_2O	0.5–3
	Na_2O	4–8
	K_2O	3–8
$Li_2O + Na_2O +$	K_2O	10–18
	CaO	0–5
	SrO	2–14
	BaO	10–20
$CaO + SrO +$	BaO	16–30
	CeO_2	0.3–1
	ZrO_2	2–8

4,277,287

SILICONE RESIN COATING COMPOSITION

Robert B. Frye, Menands, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Nov. 30, 1978, Ser. No. 964,911
Int. Cl.[3] C08K 3/36, 5/54; C08L 83/12, 83/06
U.S. Cl. 106—287.12 17 Claims

1. In an aqueous coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition having a pH of from 7.1 to about 7.8, the improvement comprising the intimate admixture of a small amount effective to control flow of a polysiloxane polyether copolymer with said composition.

4,277,288

FLUIDIZED GRANULATION OF PIGMENTS USING ORGANIC GRANULATING ASSISTANT

Simon G. Lawrence, Paisley, and James Hossack, Glasgow, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 2, 1979, Ser. No. 81,235
Claims priority, application United Kingdom, Oct. 6, 1978, 39682/78
Int. Cl.[3] C09C 3/08, 3/10
U.S. Cl. 106—309 18 Claims

1. An improved process for producing a substantially dry, low-dusting, free-flowing granular pigment product by treating a pigment in a fluidized bed with a granulating assistant wherein the improvement comprises the steps of

(a) forming a fluidized bed consisting essentially of pigment powder by blowing a stream of gas through the pigment powder;

(b) dispensing onto the fluidized bed of pigment a nonaqueous granulating assistant selected from the group consisting of:

(i) a high boiling organic liquid;

(ii) a mixture of a high boiling organic liquid and a resin;

(iii) a mixture of a high boiling organic liquid and a wax;

(iv) a mixture of a high boiling organic liquid, a resin and a wax; and

(v) a molten wax;

said assistant being one which:

(α) wets out the pigment powder surface sufficiently to allow agglomeration of pigment particles so wetted out;

(β) binds the granules so formed sufficiently strongly to enable them to resist breakdown during the process of the invention, and during subsequent handling and storage, but without adversely affecting dispersibility of the pigment product in any final application medium into which the pigment is to be incorporated; and

(γ) is compatible with the final application medium;

(c) contacting the granules formed in step (b) with a surfactant; and

(d) removing the granular pigment so formed, which still contains the granulating assistant uniformly incorporated therein, from the fluidized bed.

4,277,289

PROCESS FOR REMOVING TITANIFEROUS AND SILICO-ALUMINOUS INCRUSTATIONS FROM SURFACES

Alain Lectard, Aix-en-Provence, and Robert Magrone, Gardanne, both of France, assignors to Aluminum Pechiney, Lyons, France

Filed Jul. 6, 1979, Ser. No. 55,685
Claims priority, application France, Jul. 19, 1978, 78 22523; May 23, 1979, 79 13925
Int. Cl.[3] B08B 3/08
U.S. Cl. 134—3 8 Claims

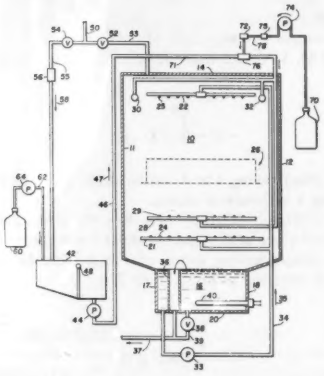
1. In a process for removing titaniferous incrustations and silico-aluminous incrustations from the walls of heat exchangers and reactors on which such incrustations form during the treatment of ores, the improvement comprising contacting the incrustations with an aqueous liquor containing from 3 to 30% by weight of hexafluosilicic acid and hydrofluoric acid present in an amount within the range of 1–10% by weight.

4,277,290

LOW TEMPERATURE WASHING AND CHEMICAL SANITIZING OF FOODWARE

James P. Andrews, Kernersville; Arthur C. Callahan, and Moheb M. Gendy, both of Winston-Salem, all of N.C., assignors to American Sterilizer Company, Erie, Pa.

Filed Jan. 25, 1980, Ser. No. 115,183
Int. Cl.[3] B08B 3/02
U.S. Cl. 134—10 22 Claims



1. Method for operating a batch-type machine providing washing of soiled foodwares and chemical sanitizing rinsing of washed foodwares to maximize productivity while minimizing energy demand rate at an installation site, comprising

providing a foodware cleansing machine having a single wash and rinse chamber with a wash water sump which, after an initial filling with wash water, is maintained at a desired wash water level and a desired wash water temperature by drainage of water into such wash water sump after wash and rinse spraying of foodware items,

such foodware cleansing machine including a separate fresh water accumulation tank capable of holding a volume of fresh water preselected to be at least one-third to about one-half the capacity of the wash sump at such desired wash water level,

inserting a load of foodware items into such foodware cleansing machine chamber,

establishing a preselected wash phase time,

establishing a preselected rinse phase time,

such rinse phase time being preselected to be between about one-tenth and about one-half the wash phase time,

washing the load of soiled foodware items by pumping wash

water from the wash sump to provide pressurized discharge of such wash water for wash spraying of such foodware item load,

controlling pumping of such wash water such that such pressurized wash spraying extends over such preselected wash phase time,

controlling supply of preheated fresh water to such fresh water accumulation tank including control of flow rate of such fresh water,

such control causing flow of fresh water from the installation site into such accumulation tank to start substantially simultaneously with initiation of pumping of washing water from the wash. sump and to extend over substantially the entire preselected wash phase time,

terminating pumping of wash water from such wash sump at expiration of such predetermined wash phase time, then

pumping such accumulated fresh water at a predetermined pressure to provide uniform flow of such accumulated fresh water within a rinse line to provide pressurized discharge for rinse spraying on such washed load,

controlling pumping of the accumulated fresh water such that pressurized rinse spraying extends over such preselected rinse phase time,

introducing a liquid chemical sanitizing agent into such flow of fresh water in the rinse line,

such introduction of liquid chemical sanitizing agent into such rinse line taking place shortly prior to such rinse spraying on such washed load,

controlling introduction of liquid chemical sanitizing agent to take place over at least a predetermined major portion of the preselected rinse phase time,

terminating introduction of liquid chemical sanitizing agent, and, with expiration of such preselected rinse phase time,

terminating pressurized pumping of fresh water in the rinse line to complete a cycle prior to unloading of such washed and rinsed foodware item load.

4,277,291

PROCESS FOR MAKING CMOS FIELD-EFFECT TRANSISTORS

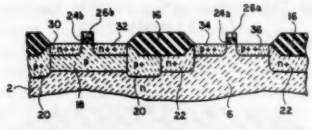
Gianfranco Cerofolini, and Giuseppe Ferla, both of Milan, Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy

Filed Jan. 21, 1980, Ser. No. 113,594

Claims priority, application Italy, Jan. 22, 1979, 19484 A/79

Int. Cl.³ C22B *21/26*

U.S. Cl. 148—1.5 **4 Claims**



1. A process for making complementary MOS field-effect transistors with contiguous channel stops in a silicon substrate of one conductivity type overlain by an oxide layer, comprising the steps of:

(a) forming a first and second patch of shielding material on said oxide layer above spaced-apart first and second regions of said substrate;

(b) injecting impurities of said one conductivity type through said oxide layer into zones of said substrate immediately adjoining said first and second regions, including an intermediate section separating said first and second regions;

(c) covering said first patch and at least one immediately adjoining first zone of said oxide layer, including a portion thereof overlying part of said intermediate section, with a masking layer while leaving uncovered said second patch and at least one immediately adjoining second zone of said oxide layer, including a portion thereof overlying another part of said intermediate section;

(d) injecting impurities of the opposite conductivity type into said substrate through said second patch and through said second zone in a quantity sufficient to overcompensate the effect of the impurities of said one conductivity type injected into said second zone in step (b) and to implant said impurities of the opposite conductivity type with a relatively high concentration in said uncovered second zone and with a lower concentration in said second region shielded by said second patch;

(e) removing said masking layer;

(f) subjecting said substrate to a heat treatment with growth of said oxide layer predominantly in areas free from said patches;

(g) removing said patches together with underlying portions of said oxide layer, thereby exposing said first and second regions except for a residue of said oxide layer extending across each of said regions and dividing same into source and drain areas while forming an insulating gate support; and

(h) introducing impurities of said one conductivity type and of said opposite conductivity type into the source and drain areas of said second and said first region, respectively.

4,277,292

TERNARY CORROSION RESISTANT COATINGS

George L. Tupper, Gurnee, Ill., assignor to Coral Chemical Company, Waukegan, Ill.

Filed Mar. 26, 1980, Ser. No. 134,220

Int. Cl.³ C23F *7/00*

U.S. Cl. 148—6.27 **18 Claims**

1. An acidic aqueous coating solution for forming a corrosion resistant coating on aluminum consisting essentially of a ternary composition of zirconium, a soluble vegetable tannin, and a fluoride, wherein the concentration of the zirconium ion is 0.014 to 0.096 grams/liter, the vegetable tannin concentration is 0.060 to 0.024 grams/liter, and the fluoride concentration is 0.020 to 0.140 grams/liter, and excluding phosphate ion and a source of hydrogen ion to adjust the pH of the coating solution between 2.3 and 2.95.

4,277,293

GROWTH OF SYNTHETIC DIAMONDS HAVING ALTERED ELECTRICAL CONDUCTIVITY

Richard S. Nelson, 5 Whitehills Green, Goring-on-Thames, Reading, Berkshire; John A. Hudson, 7 Little Howe Close, Radley, Oxfordshire, and David J. Mazey, 63 Hendred Way, Abingdon, Oxfordshire, all of England

Division of Ser. No. 878,862, Feb. 17, 1978, Pat. No. 4,191,735, which is a continuation-in-part of Ser. No. 711,578, Aug. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 477,280, Jun. 7, 1974, abandoned. This application Aug. 20, 1979, Ser. No. 68,068

Claims priority, application United Kingdom, Jun. 2, 1977, 23468/77

The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.

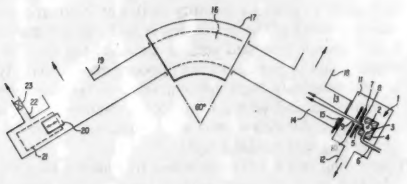
Int. Cl.³ H01L *21/20, 21/26*

U.S. Cl. 148—175 **12 Claims**

1. A method of producing a diamond crystal of altered electrical conductivity which comprises bombarding the diamond with a flux of carbon ions containing an ionic impurity whereby the crystal is doped with an impurity which alters the electrical conductivity thereof, said flux being of sufficient energy to penetrate the diamond crystal and cause crystal growth which is at least predominantly internal, the temperature of the crystal being at least 400° C. and less than the graphitisation temperature, such that the diamond crystal structure is maintained during growth.

7. A method according to claim 1, in which the carbon ion

flux contains an ionic impurity which gives rise to either P- or N-type conductivity in the crystal following which the crystal



is doped with a different ionic impurity which gives rise to the other type of conductivity so as to produce an P N junction in the crystal.

4,277,294

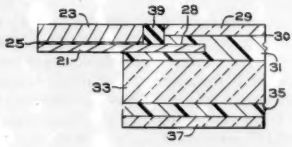
METHOD OF FABRICATING WINDOW PANELS, PARTICULARLY CURVED PANELS

Dee R. Orcutt, Huntsville, Ala., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 6, 1979, Ser. No. 46,150

Int. Cl.³ B32B *17/10, 31/20;* **C03C** *27/04*

U.S. Cl. 156—102 **8 Claims**



1. A method of fabricating a curved, laminated transparency panel having a curved, rigid mounting frame surrounding a curved, laminated transparency provided with transparent elements and also including a curved, metal reinforcing insert having an inner portion embedded therein and an outer portion bonded to said frame comprising first applying bonding means to an interfacial surface between said frame and said insert, then assembling said frame and said insert on opposite sides of said bonding means to bond the outer portion of said insert to said frame to form a curved sub-assembly with the inner portion of said curved insert extending inwardly of said curved frame, thereby enabling the bond between said curved frame and said outer portion of said curved insert to reinforce the inner portion of said insert, then assembling the elements of said curved, laminated transparency to the inner portion of said curved insert, and laminating said curved assembly so formed with minimum movement of said inner portion relative to the thickness of said transparency elements during said latter laminating step.

5. A method as in claim **1**, comprising applying said bonding means in the form of a bonding tape to an interfacial surface between said rigid mounting frame and said outer portion of said insert to form said sub-assembly and subjecting the sub-assembly so formed to elevated heat and pressure to effect said bonding step.

7. A method as in claim **5**, wherein said bonding tape applied is a thermosetting tape.

8. A method as in claim **7**, wherein said tape is applied to the interfacial portion between the outer portion of said curved metal reinforcing insert and said curved mounting frame.

4,277,295

PROCESS OF MANUFACTURING PNEUMATIC TIRES AND APPARATUS FOR CARRYING OUT THE PROCESS

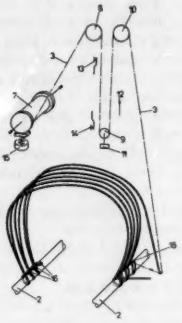
Oskar Schmidt, Kittsee, and Wladyslaw Kubica, Vienna, both of Austria, assignors to Polyair Maschinenbau G.m.b.H., Kittsee, Austria

Filed Sep. 10, 1979, Ser. No. 73,782

Claims priority, application Austria, Sep. 8, 1978, 6520/78; May 25, 1979, 3843/79

Int. Cl.³ B29H *17/12*

U.S. Cl. 156—117 **13 Claims**



1. A process of manufacturing pneumatic tires made of synthetic elastomers, particularly of polyurethane, and comprising an inner tire layer, a tire body, which is anchored in the inner tire layer by means of bead cores, a belt, and an outer tire layer provided with a tread portion, said process being characterized in that the tire body is made in that a cord or cable is wound radially from one bead core to the other bead core over the periphery of a forming core but spaced from the surface of said forming core while being anchored in alternation on at least one of the two bead cores provided on both sides of the tire by being completely slung around each bead core, that a peripherally extending belt is applied, and that finally the outer tire layer and the tread portion are applied.

4,277,296

PNEUMATIC TIRE AND METHOD OF MAKING SAME

Frank O. Skidmore, 2513 Third St., Cuyahoga Falls, Ohio 44221

Continuation-in-part of Ser. No. 834,246, Sep. 19, 1977, Pat. No. 4,196,764. This application Sep. 28, 1979, Ser. No. 80,114

Int. Cl.³ B29H *17/20*

U.S. Cl. 156—128 R **4 Claims**

1. A method of preparing a pneumatic tire having a tread, a carcass, sidewalls, at least one belt, and a strip of scrim material positioned between the base of the tread and carcass over the full circumference thereof and across a substantial width of the tread which is characterized by the scrim material, including perpendicularly related warp and weft cords with respective cords extending in substantially parallel straight relationship to each other in an open weave spaced between warp and weft to form a belt around the full circumference of the tire, said cords having great tensile strength and being subject to minimal elongation within their designed tensile strength, said cords acting to reduce radial force variations and reduce squirm and

friction between tread and carcass in the tire under operating conditions, and said cords being joined and interlocked at their intersection which comprises the steps of:

(a) providing the scrim material fully embedded in at least one layer of uncured rubber material to achieve an intimate matrix relationship,

(b) applying the scrim and uncured rubber material layer at the desired position on the carcass over the full circumference thereof and width beyond the lateral edges of the belt while stretching it to achieve a snug positioning and intimate contact of the uncured rubber material to the carcass, and

(c) applying the tread material over the scrim material and curing the tire to effect vulcanization and a bonded relationship between the tread, the uncured layer intimately combined with the cords, and the carcass.

4,277,297

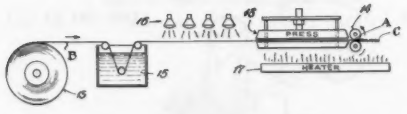
METHOD OF FORMING DENTAL FLOSS WITH STRING AND BRUSH PORTIONS

Thomas F. Thornton, New Canaan, Conn., assignor to Educational Health Products, Inc., New Canaan, Conn.

Division of Ser. No. 599,485, Jul. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 138,501, Aug. 27, 1971, abandoned, and Ser. No. 361,237, May 17, 1973, Pat. No. 3,896,824. This application Dec. 12, 1979, Ser. No. 102,797

Int. Cl.³ D02G *3/34;* A61C *15/00*

U.S. Cl. 156—161 **5 Claims**



1. Method of producing a continuous length of multi-diameter, multi-filament yarn having alternate string portions comprising straight, parallel, closely packed filaments and compressible, spongy brush portions comprising crinkled filaments which are stiffened to render them more resistant to compression, comprising the steps of producing a continuous length of yarn comprising a plurality of textured, commingled filaments that have been permanently crinkled, coating said yarn with a hardenable resin coating, stretching said coated alternate string portions to straighten the filaments therein and render them parallel to each other and closely packed while retaining said brush portions in a relaxed, crimped condition, heating said coated yarn to harden said resinous coating and render the filaments in said alternate string lengths essentially straight and crinkle resistant and to render the filaments in said brush portions stiffened and more resistant to compression, and relaxing said stretch on said string portions to form said continuous length comprising said alternate straight string portions and said stiffened, crinkled brush portions, said brush portions comprising lengths of said yarn which have not been rendered straight and crinkle resistant and in which the filaments are crinkled, to render the diameter of said brush portions larger than the diameter of said string portions, and are coated with resin and stiffened to render them more resistant to compression.

4,277,298

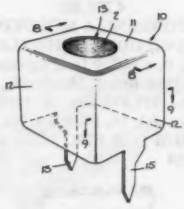
METHOD OF MAKING A HOLLOW ARTICLE

Charles C. L'Allemand, Murray Hill, N.J., assignor to The Cly-Del Manufacturing Company, Waterbury, Conn.

Continuation of Ser. No. 372,917, Jun. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 350,775, Apr. 13, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,472

Int. Cl.³ B21D *22/00, 39/00*

U.S. Cl. 156—199 **13 Claims**



1. A method of making a housing for electronic components comprising the steps of:

providing a stock of first material;

applying a layer of second material to said stock of first material to form a composite structure, the layer of second material being applied so that said composite structure is devoid of said second material at a predetermined zone thereof; and

forming a housing having at least one anchoring member and a cup-like body from said composite structure, the forming step being controlled to locate said at least one anchoring member of said housing in the portion of said composite structure which includes said predetermined zone devoid of said second material and to locate said cup-like body of said housing in the portion of said composite structure having said layer of second material applied to said stock of said first material so that said at least one anchoring member remains free of said second material.

4,277,299

RELEASE MOLDS FOR LAMINATING BILAYER SAFETY GLASS

Joseph Cherenko, Valencia; William I. Frey, Curtisville; Joseph D. Kelly, Cheswick, all of Pa., and Larry S. Sokol, West Palm Beach, Fla., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 836,178, Sep. 23, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,673

Int. Cl.³ B32B *17/10, 31/04;* C04B *35/68*

U.S. Cl. 156—242 **1 Claim**

1. In a method for making a transparent safety glass laminate having an exposed plastic surface comprising the steps of:

a. assembling between a glass sheet to be laminated and a glass mold coated with a release agent, a polymer selected from the group consisting of polyvinyl acetals and polyurethanes;

b. bonding said polymer to said glass sheet; and

c. separating the glass mold from the polymer layer of the laminate, the improvement which comprises coating the glass mold on the surface which contacts the polymer layer with a composition comprising a release agent which contains

1. from 80 to 98 percent by weight phenyl methyl polysiloxane resin with from 1.0 to 1.7 hydrocarbon radicals per silicon atom;

2. from 1 to 10 percent by weight of a phenyl methyl siloxane fluid which has from 1.99 to 2.00 hydrocarbon radicals per silicon atom and which contains at least 1 percent by weight of silicon-bonded hydroxyl groups;

3. from 1 to 10 percent by weight of a nonhydroxylated methyl siloxane fluid which has at least 2.0 monovalent hydrocarbon radicals per silicon atom;

and a low molecular weight, hydroxy-functional silicone compound of the formula $R_nSi(OR')_mO_{4-n-m/2}$ wherein R is a monovalent hydrocarbon radical, R' is selected from the group consisting of hydrogen and alkyl radicals containing from 1 to 6 carbon atoms, n has an average value from 0.9 to 1.9 and m has an average value from 0.1 to 1.5, and the compound having about four hydroxyl groups per molecular formula unit.

4,277,300

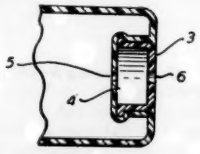
METHOD FOR FORMING A MOLDED SQUEEZE TOY INCLUDING WHISTLE

Anthony P. Taluba, Box 245, R.D. 3, Lebanon, N.J. 08833, and Paul A. Taluba, 319A Rte. 1, Morrisville, N.Y. 12962

Division of Ser. No. 727,473, Sep. 28, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 923,462

Int. Cl.³ B32B *1/10;* **B29C** *17/07;* **A63H** *5/00*

U.S. Cl. 156—244.14 **6 Claims**



1. The method of forming, by blow molding in a blow molding machine, a hollow air-filled squeeze body including a whistle which comprises the steps of:

providing a mass of molten thermoplastic rubber;

extruding rubber from said molten mass to form a parison which passes between a pair of mold-halves shaped to form between them said squeeze body, said mold-halves including means for forming an annular whistle cavity site adjacent to or in a wall of said body and including a blow pin opening centered in said site;

interposing a blow pin of substantially uniform cross-section into said parison;

closing said mold-halves to clamp said parison so that said blow pin is enclosed in said blow pin opening;

causing a first blast of gas to blow through said blow pin for shaping said parison against the interior of said mold-halves including said means for forming an annular whistle cavity;

opening said mold-halves;

retracting said blow pin through said blow pin opening in said hollow squeeze body;

subsequently removing said hollow squeeze body from said blow molding machine by a second blast of gas;

forming and securing a closure on said whistle cavity to form therewith a resonant chamber for sounds of a preselected frequency, said closure having an opening which is axially aligned with said blow pin opening, wherein both of said openings act as venturi constrictions for a stream of air passing therethrough when said hollow body is squeezed.

4,277,301

WIDE-BAND AND CONTINUOUS LINE ADHESIVE APPLICATOR FOR CIGARETTE FILTER ATTACHMENT AND THE LIKE

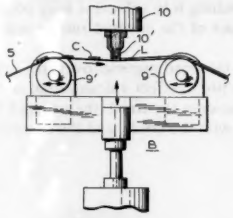
Donald B. McIntyre, and Frederic S. McIntyre, both of Wellesley Hills, Mass., assignors to Acumeter Laboratories, Inc., Newton Lower Falls, Mass.

Filed Aug. 27, 1979, Ser. No. 69,973

Int. Cl.³ B65C *3/12;* **B05B** *1/14, 9/12*

U.S. Cl. 156—446 **9 Claims**

1. A fluid adhesive applicator having, a plurality of fine-orifice spaced nozzles disposed in a plane and extending transversely of a predetermined region; means for drawing a web of material-to-be-coated longitudinally through said predetermined region in juxtaposition to the orifices of said nozzles; pumping means for extruding fluid adhesive simultaneously through said nozzles onto the web as a corresponding plurality of closely spaced beads of adhesive extending transversely across said web; shear edge means disposed a short distance



longitudinally beyond said orifices; the web carrying said beads from said nozzles to said shear edge means; and periodically activated bumper means disposed on the opposite side of the web from the edge means for bumping said plurality of adhesive beads carried by the web against said edge means to cause spreading of the beads into longitudinally intermittent bands of adhesive having a width in the range extending from bands of parallel stripes corresponding to the width of said beads to a merged-uniform continuous coating band.

4,277,302

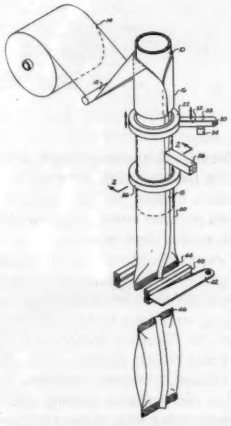
APPARATUS FOR ADVANCING SHEET MATERIAL

Philip Reid, Rte. 2, Box 422, Duncan, S.C. 29334

Filed Sep. 7, 1979, Ser. No. 74,140

Int. Cl.³ B29D *23/10*

U.S. Cl. 156—466 **6 Claims**



1. An apparatus for advancing thin flexible sheet material over a cylindrical mandrel, comprising:

means for feeding said sheet material in a tubular configuration longitudinally over said mandrel;

a collar concentrically carried on said mandrel with said sheet material passing between said collar and said mandrel;

a unidirectional driving means carried by said collar engaging said sheet material passing between said collar and said mandrel;

means for reciprocally moving said unidirectional driving means to and fro longitudinally relative to said mandrel advancing said sheet material over said mandrel; and

said unidirectional driving means comprises a flange member inclined towards the mandrel in the desired direction of advancement of said sheet material engaging said sheet material and advancing sheet material when moved forward over said mandrel and said flange member sliding over said sheet material when moved backward over said mandrel.

4,277,303

GETTER FOR MELT-GROWN SCINTILLATOR INGOT AND METHOD FOR GROWING THE INGOT

Carl F. Swinehart, University Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed Aug. 7, 1978, Ser. No. 931,323
Int. Cl.³ C30B *11/06, 29/12*
U.S. Cl. 156—616 R **8 Claims**

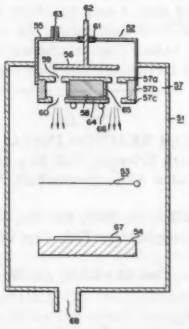
1. In a Stockbarger or Kyropoulos process for growing an alkali metal halide scintillator ingot from a melt in a furnace, the improvement comprising distributing in said melt from about 5 to about 1000 parts per million parts (ppm) by weight of said melt, of each component of a combination getter consisting essentially of at least a slightly melt-soluble reactive oxide of boron as one component, and an insoluble but active silicon dioxide as the other component, and superheating said melt for a period of time sufficient to react at least some of each component with trace impurities present in said melt.

4,277,304

ION SOURCE AND ION ETCHING PROCESS

Yasuhiro Horiike, Tokyo; Haruo Okano, Yokohama; Masahiro Shibagaki, Hiratsuka, and Katsuo Kadono, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 22, 1979, Ser. No. 87,041
Claims priority, application Japan, Nov. 1, 1978, 53-133718
Int. Cl.³ H01L *21/306;* **H01J** *17/04*
U.S. Cl. 156—643 **9 Claims**



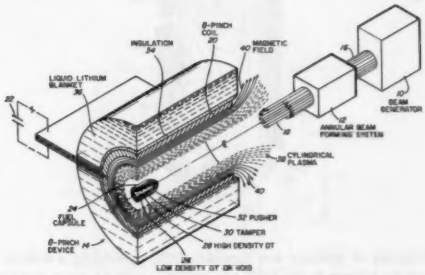
9. An ion etching process, comprising steps of introducing a gas into a vacuum container; applying a voltage between an anode and a cathode with a looped slit which are disposed opposite to each other in said vacuum container, so that an orthogonal electromagnetic field may be formed in the vicinity of said looped slit as a combination of an electric field created by said impression of the voltage and a magnetic field created by a permanent magnet which is disposed in a position corresponding to a portion of said cathode that is surrounded by said looped slit; generating gas plasma from said gas by means of said orthogonal electromagnetic field; taking out positive ions in said gas plasma through said looped slit; and applying said extracted positive ions to a workpiece to be etched.

4,277,305

BEAM HEATED LINEAR THETA-PINCH DEVICE FOR PRODUCING HOT PLASMAS

Ihor O. Bohachevsky, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 13, 1978, Ser. No. 960,410
Int. Cl.³ G21B *1/00*
U.S. Cl. 176—1 **5 Claims**



1. A device for generating a hot plasma comprising:

a cylindrically shaped fuel element concentrically aligned with a predetermined axis;

a linear theta pinch device concentrically aligned with said predetermined axis;

a working gas contained within said linear theta pinch device;

cylindrical plasma sheath means generated by said linear theta pinch device from said working gas for producing a theta pinch compression wave in said fuel element;

a concentric fuel element plasma layer formed by vaporization and ionization of an outer portion of said fuel element by the application of said cylindrical plasma sheath to said fuel element;

annular beam means concentrically aligned with said concentric fuel element plasma layer to dispose energy in said concentric fuel element plasma layer sufficient to ablatively drive said fuel element to produce a beam generated compression wave in said fuel element;

whereby said theta pinch compression wave and said beam generated compression wave arrive at the center of said fuel element nearly simultaneously to enhance generation of said hot plasma.

4,277,306

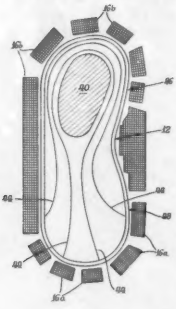
COIL-LESS DIVERTORS FOR TOROIDAL PLASMA SYSTEMS

Tihiro Ohkawa, LaJolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Dec. 22, 1977, Ser. No. 863,521
Int. Cl.² G21B *1/00*
U.S. Cl. 176—9 **4 Claims**

1. In a toroidal plasma confinement method including the steps of providing a toroidal vacuum chamber zone, providing a high temperature hydrogen plasma in the vacuum chamber zone and a toroidal magnetic field in which the plasma is embedded, and providing a poloidal magnetic field in which the plasma is embedded, the improvement comprising controlling plasma impurities by generating a magnetic plasma confining field for confining a high temperature plasma having continuous inner flux lines in a high temperature plasma zone in a plasma vacuum chamber without internal divertor coils, which chamber is elongated in a direction along the major toroidal axis, generating a region of lower magnetic field strength in said elongated vacuum chamber for confining a plasma of lower temperature than said high temperature plasma to provide said poloidal field with a field configuration in which the radially outer flux lines of said poloidal magnetic field about

the high temperature plasma are axisymmetrically bound to terminate at the vacuum chamber wall about said region of lower magnetic field strength adjacent the high temperature plasma in a direction along the major toroidal axis opposite the



direction of positive ion toroidal drift, providing a source of pure hydrogen at the high temperature plasma zone, evacuating the low temperature plasma zone, and maintaining a low temperature plasma adjacent the high temperature plasma.

4,277,307

METHOD OF RESTORING SI CRYSTAL LATTICE ORDER AFTER NEUTRON IRRADIATION

Peter Voss, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 842,606, Oct. 17, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,912

Int. Cl.³ G21G *1/06*

U.S. Cl. 176—10 **1 Claim**

1. In a method of restoring crystal lattice order in a carbon containing Si monocrystal by annealing this crystal at a minimum temperature, wherein such Si monocrystal is doped by neutron irradiation within a nuclear reactor and is then annealed as a function of irradiation conditions (ratio of thermal to fast neutrons) therein and as a function of the amount of carbon within such irradiated Si monocrystal, the improvement comprising:

determining the amount of carbon within the Si crystal; and adjusting the annealing temperature so that:

(a) when the ratio of the thermal to fast neutrons within such nuclear reactor is in the range of 1:1 to less than 10:1 and

(a_1) the amount of carbon within said irradiated Si monocrystal is greater than $3 \cdot 10^{16}$ atoms/cm^3, the annealing temperature is adjusted to a value greater than 1100° C., and

(a_2) the amount of carbon within said irradiated Si monocrystal is less than $3 \cdot 10^{16}$ atoms/cm^3, the annealing temperature is adjusted to a value in the range of 750° to 1000° C.; and

(b) when the ratio of thermal to fast neutrons within said nuclear reactor is in the range of 10:1 to less than 100:1 and

(b_1) the amount of carbon within said irradiated Si monocrystal is greater than $3 \cdot 10^{16}$ atoms/cm^3, the annealing temperature is adjusted to a value greater than 1000° C., and

(b_2) the amount of carbon within said irradiated Si monocrystal is less than $3 \cdot 10^{16}$ atoms/cm^3, the annealing temperature is adjusted to a value of at least 750° C.

4,277,308

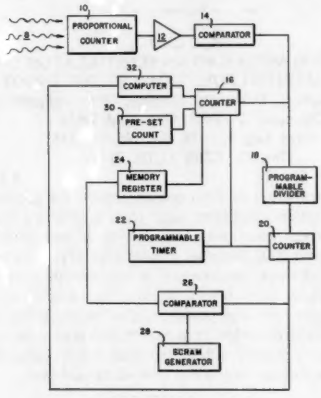
COUNT-DOUBLING TIME SAFETY CIRCUIT

Gordon K. Rusch, Downers Grove; Donald J. Keefe, Lemont, and William P. McDowell, Downers Grove, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 23, 1978, Ser. No. 918,259

Int. Cl.³ G21C *17/00*; G01T *3/00*

U.S. Cl. 176—19 EC **5 Claims**



1. A rate of change of reactor power level count-factor-increase time monitor for developing a scram signal with the count-factor-increase time less than or equal to a particular value corresponding to an asymptotic period T, comprising a pulse-type neutron detector having a pulsed output developing pulses corresponding to the incidence of a neutron thereon, means coupled to said detector for counting the number of pulses N_1 therefrom during a first time period Δt, means coupled to said detector for counting the number of pulses N_2 therefrom during a next time period Δt divided by n, said next time period Δt beginning at the end of said first time period Δt, where n is greater than 1 and $\Delta t = T(1n\ n)$, and comparator means coupled to both said means for counting and being responsive to the values counted thereof to develop a scram signal with $N_2 \geqq 1.1N_1$ during said next time period.

4,277,309

NUCLEAR REACTOR INSTALLATION

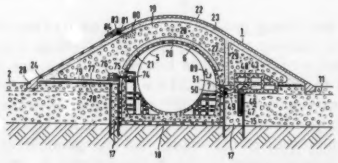
Hans-Peter Schabert, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,257

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634294

Int. Cl.² G21C *19/20*

U.S. Cl. 176—37 **14 Claims**



1. Nuclear reactor installation having a tight concrete tank sunk at least in part into earth formed with a groundwater-permeable layer and a largely impermeable layer providing a lower boundary for the groundwater-permeable layer, com-

prising a ring wall disposed in the earth and surrounding the concrete tank, said wall extending down through the groundwater-permeable layer at least to the impermeable layer, means for connecting groundwater in the part of the groundwater-permeable layer enclosed by said wall with groundwater in the part of the groundwater-permeable layer located outside said wall, said connecting means including a pump for maintaining a negative pressure in the groundwater in the permeable layer part enclosed by said wall and a filter for separating activity carriers from the groundwater in the permeable layer part enclosed by said wall, and a hill of fill-earth directly covering the top of the concrete tank, said hill being formed of strata of material of varying permeability including an impermeable stratum forming an outer surface of said hill and extending beyond said wall.

4,277,310
WATER-COOLED NUCLEAR REACTOR

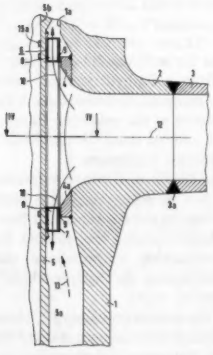
Wolfgang Braun, Buckenhof, and Leonhard Irion, Rückersdorf, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Ag, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed May 15, 1975, Ser. No. 577,874

Claims priority, application Fed. Rep. of Germany, May 20, 1974, 2424427

Int. Cl.³ G21C *9/00, 15/00*

U.S. Cl. 176—50 **6 Claims**



1. A water-cooled nuclear reactor including a pressure vessel having a wall with an inside and an outside and provided with a water-coolant inlet nozzle having inner and outer ends with insides, a pipe on the outside of the vessel and connected with the outer end of the nozzle and normally providing a flow of water coolant entering the vessel through the inner end of the nozzle, and a check valve assembly for the inner end of the nozzle and enclosed within the inside of the nozzle and vessel, the assembly comprising a plurality of individually swinging flap valves and means for mounting the flap valves so that they operate in parallel and are interposed in said flow and so that they are swung open by said flow and closed by a reverse flow; said reactor having a core barrel within the said vessel, the barrel having an outside, the barrel's outside and the vessel's inside forming a space into which the inner end of the nozzle opens, said means comprising an annular frame surrounding the nozzle's inner end and substantially closing off said space, the frame forming radial passages and the flap valves being positioned to open and close these passages.

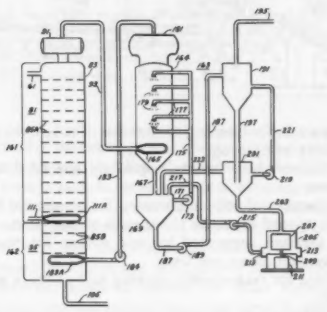
4,277,311
APPARATUS FOR DISTILLATION

Daniel Kwasnoski, Hellertown, and Charles J. Sterner, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 695,625, Jun. 14, 1976, Pat. No. 4,140,586. This application Nov. 27, 1978, Ser. No. 963,869

Int. Cl.³ B01D *3/38*

U.S. Cl. 202—183 **9 Claims**



1. A regenerative vapor stripping apparatus for removing volatile components from a liquid comprising:

(a) a stripping column containing mass transfer contact means,

(b) a direct contact regenerative, countercurrent heat exchanger adjacent to the stripping column and containing heat exchange means comprised of mass transfer contact means arranged and constructed to provide a countercurrent flow heat recovery zone in the heat exchanger,

(c) conduit means operatively connected with the upper portion of the stripping column to conduct a liquid containing volatilizable components into said upper portion of the stripping column,

(d) conduit means operatively connected with the lower portion of the stripping column to conduct a primary heating and stripping gas into said lower portion of the stripping column separate from any heat exchange apparatus,

(e) liquid passage means operatively connecting the lower portion of the stripping column with the upper portion of the direct contact heat exchanger to conduct hot stripped liquid from said lower portion of the stripping column to said upper portion of the direct contact heat exchanger,

(f) conduit means operatively connected with the lower portion of the direct contact heat exchanger to conduct cooled stripped liquid from said lower portion of the direct contact heat exchanger,

(g) conduit means operatively connected with the lower portion of the direct contact heat exchanger to conduct a cool inert noncondensable gas into the lower portion of said direct contact heat exchanger,

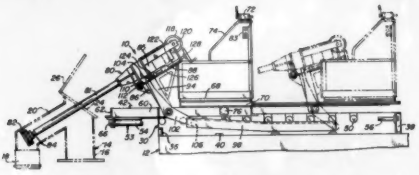
(h) gas passage means operatively connecting the upper portion of the direct contact heat exchanger to the lower portion of the stripping column to conduct hot inert noncondensable gas from said upper portion of the direct contact heat exchanger to said lower portion of the stripping column,

(i) conduit means operatively connected with the upper portion of the stripping column to conduct volatile components from the upper portion of the stripping column.

4,277,312
ASCENSION PIPE CLEANING APPARATUS

James F. McKenna, and Douglas O. Anderson, both of Pittsburgh, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sep. 15, 1980, Ser. No. 187,301
Int. Cl.³ C10B 43/08
U.S. Cl. 202—241 6 Claims



1. Apparatus for cleaning the interior of coke oven ascension pipe elbows comprising:

(a) a support base having oppositely spaced, longitudinal beams;

(b) a plurality of rollers journaled for rotation at longitudinally spaced locations along each of said beams;

(c) a carriage supported by said rollers for translational movement along said base;

(d) means for reciprocably moving said carriage along said base;

(e) a cleaning tool pivotally secured to said carriage;

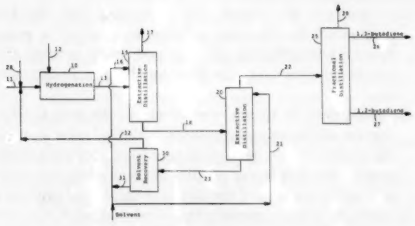
(f) a cam mounted in fixed relation to said base; and

(g) a cam follower connected between said cleaning tool and said cam, whereby the cleaning tool is imparted with a compound movement in response to the action of said cam and said reciprocating means to guidingly manipulate said cleaning tool within said ascension pipe elbow.

4,277,313
RECOVERY OF 1,3-BUTADIENE

Yuv R. Mehra, Odessa, and Ralph E. Clark, Corpus Christi, both of Tex., assignors to El Paso Products Company, Odessa, Tex.

Filed Mar. 27, 1980, Ser. No. 134,687
Int. Cl.³ B01D 3/34
U.S. Cl. 203—32 18 Claims

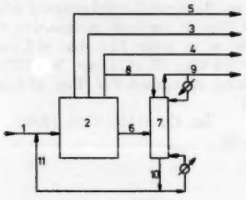


9. In a process for recovering 1,3-butadiene from a hydrocarbon mixture containing C_4-alkanes, C_4-alkenes, C_4-alkadienes and C_4-alkynes the improvement which comprises (1) providing a crude hydrocarbon mixture containing butanes, butenes, 1,3-butadiene, 1,2-butadiene pentanes, pentenes and between about 0.2–30 percent of C_4-alkynes comprising methylacetylene, vinylacetylene and ethylacetylene; (2) directly introducing said crude mixture into a hydrogenation zone and selectively hydrogenating the alkynes in the mixture whereby the alkyne content of the mixture is substantially reduced, thereby eliminating the need for secondary processing steps to separate alkyne components from butadiene components; (3) introducing the hydrogenated hydrocarbon mixture into an intermediate zone of a first extractive distillation unit, and contacting the said hydrocarbon mixture with a selective solvent in the extractive distillation unit and which solvent dissolves 1,3-butadiene more readily than the butanes and butenes; (4) recovering from the extractive distillation unit an overhead distillate fraction containing butanes and butenes, and recovering a bottom solution phase containing 1,3-butadiene; and (5) introducing the said solution phase into an intermediate zone of a second extractive distillation unit, and contacting the solution phase with additional selective solvent in the second extractive distillation unit under conditions which provide for the recovery of an overhead distillate fraction containing 1,3-butadiene, and the recovery of a solvent phase which contains residual acetylenes.

4,277,314
ISOLATION OF 1,3-BUTADIENE FROM A C4-HYDROCARBON MIXTURE

Alfred Lindner, Bobenheim-Roxheim; Klaus Volkamer, Frankenthal, and Ulrich Wagner, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 18, 1979, Ser. No. 40,283
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2823983
Int. Cl.³ B01D 3/40
U.S. Cl. 203—50 4 Claims



1. A process for isolating 1,3-butadiene by means of a selective solvent from a C_4-hydrocarbon mixture which contains 1,3-butadiene, propyne, hydrocarbons which are more soluble than 1,3-butadiene in the selective solvent and hydrocarbons which are less soluble than 1,3-butadiene in the selective solvent, which process comprises:

a. subjecting the C_4-hydrocarbon mixture to extractive distillation in a butadiene isolation plant, wherein the C_4-hydrocarbon mixture is separated into a distillate containing the hydrocarbons less soluble than 1,3-butadiene, a stream containing 1,3-butadiene and propyne, and a stream containing the hydrocarbons more soluble than 1,3-butadiene,

b. distilling the stream containing 1,3-butadiene and propyne in a distillation zone downstream of the extractive distillation in the butadiene isolation plant to obtain a stream of 1,3-butadiene which is recovered and as a distillate a hydrocarbon mixture containing 1,3-butadiene and the propyne,

c. subjecting the distillate from the downstream distillation zone to distillation in an additional distillation zone, said distillate being fed into the additional distillation zone in a middle region, extending from the middle of the additional distillation zone to the extent of about 80% into both the upper and lower half of the additional distillation zone,

d. feeding at the same time a second stream of liquid or gaseous hydrocarbons to the additional distillation zone at or above the feed point of the distillate from the downstream distillation zone, obtaining as overhead from the additional distillation zone a propyne-containing hydrocarbon mixture having a 1,3-butadiene content of not more than 10% by weight, and

e. recycling the 1,3-butadiene-containing bottom product only from the additional distillation zone to the extractive distillation zone solely within said butadiene isolation plant.

4,277,315
ISOLATION OF A CONJUGATED DIOLEFIN FROM A C_4- OR C_5-HYDROCARBON MIXTURE

Klaus Volkamer, Frankenthal; Klaus Broellos, Seebeim; Alfred Lindner, Bobenheim-Roxheim; Ulrich Wagner, Limburgerhof; Hans-Martin Weitz, Bad Duerkheim, and Klaus-Juergen Schneider, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,897

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911394

Int. Cl.³ B01D *3/40;* C07C *7/08*

U.S. Cl. 203—51 3 Claims

1. A process for isolating a conjugated diolefin from a C_4- or C_5-hydrocarbon mixture containing the diolefin, by extractive distillation using a selective solvent, wherein the selective solvent is a solvent mixture which comprises

(a) from 50 to 98 percent by weight of a N-alkyl-substituted lower aliphatic acid amide or of a N-alkyl-substituted alicyclic acid amide having 5 ring members and

(b) from 2 to 50 percent by weight of a lower aliphatic carboxylic acid ester or carbonic acid ester boiling at from 30° C. to 200° C.

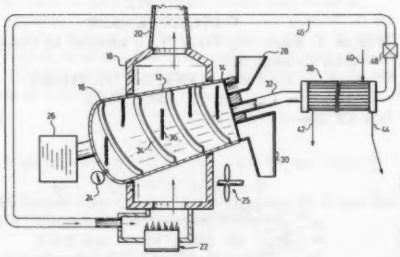
4,277,316
SOLVENT EXTRACTION PROCESS

Robert A. Taylor, 368 Ferry Point Rd., Pasadena, Md. 21122

Filed Dec. 4, 1979, Ser. No. 100,132

Int. Cl.³ B01D *3/08*

U.S. Cl. 203—99 4 Claims



1. A process for separating solvents from solvent bearing material, comprising providing a reactor vessel rotatable about a substantially horizontal axis and having internal vanes operable to move the material from one end towards the other end of the vessel when the vessel is rotated in one direction and to move the material towards said one end when the vessel is rotated in the opposite direction, feeding said material to said one end of the realtor vessel, heating the reactor vessel to a predetermined temperature while rotating the vessel in said one direction to cause solvent to be distilled from the material, collecting distilled gases from said one end of the vessel and subsequently cooling said gases to condense the distillate,, continuing the heating of the vessel to a temperature high enough to produce a free-flowing residue when the reactor vessel is cooled, cooling the vessel, and rotating the vessel in said opposite direction to cause the residue to be discharged from said one end of the vessel.

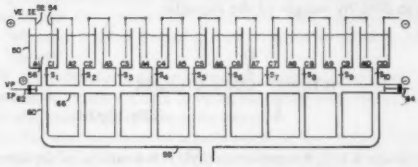
4,277,317
SHUNT CURRENT ELIMINATION AND DEVICE EMPLOYING TUNNELED PROTECTIVE CURRENT

Patrick G. Grimes, Westfield, N.J., and Markus Zahn, Gainesville, Fla., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 26, 1979, Ser. No. 97,194

Int. Cl.³ C25B *9/04, 15/06;* H01M *8/04, 2/38*

U.S. Cl. 204—1 R 42 Claims



1. A method of minimizing shunt currents in an electrochemical device having a plurality of cells, said cells being connected, at least in part, in series, said device having an electrolyte which is fed to at least two of said cells as a shared electrolyte from a common manifold via individual inlet channels, whereby an electrical electrolytic conductive bypass path is created around these cells and through said shared electrolyte, which otherwise results in undesirable shunt currents, said method comprising providing electrolyte tunnels which connect the individual inlet channels and applying a protective current through said electrolyte tunnels and thus through said shared electrolyte, the protective current being of a magnitude which effectively at least reduces said shunt currents.

4,277,318
ELECTROCHEMICAL BENZYLIC OXIDATIONS

Paul L. Matlock, White Plains, and Michael R. Sandner, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 15, 1980, Ser. No. 140,610

Int. Cl.³ C25B *3/02*

U.S. Cl. 204—78 12 Claims

1. Method of oxidizing benzylic methylene groups to ketones which comprises in a membrane divided electrolytic cell having an anolyte compartment and a catholyte compartment each fitted with an anode and cathode respectively in a closed circuit connected to a d.c. power source,

(a) charging said anolyte compartment with a biphasic aqueous-organic solvent system comprising a hydrocarbon having about 7 to about 30 carbon atoms and at least one benzylic methylene group, about 0.01 to about 10,000 moles of 0.001 to 30 N aqueous mineral acid per mole of hydrocarbon, about 1×10^{-6} to about 100 moles of a manganese compound per mole of hydrocarbon, and a catalytic amount of a phase transfer catalyst in one phase, together with about 0.1 to about 10,000 moles of an alkylene halide having 2 to about 6 carbon atoms per mole of hydrocarbon in a second phase;

(b) charging 0.01 to about 10,000 moles of 0.01 to 30 N aqueous mineral acid per mole of hydrocarbon to the catholyte compartment; and

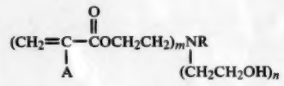
(c) passing sufficient direct current through said electrolytic cell to convert the hydrocarbon benzylic methylene groups to ketone groups.

4,277,319
RADIATION CURABLE COMPOSITIONS

Kayson Nyi, Sellersville, and Sandra I. Graham, North Wales, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 466,353, May 2, 1974, Pat. No. 4,001,304.
This application Apr. 22, 1976, Ser. No. 679,254
Int. Cl.[3] C08J *3/28*
U.S. Cl. 204—159.23 4 Claims

1. A radiation curable composition containing (1) from about 5 to 80% by weight of the formula:

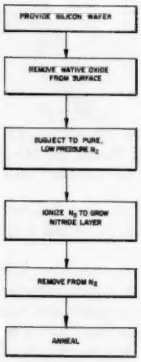


wherein A is hydrogen or methyl; R is a radical of the formula $-CH_2CH_2X$ wherein X is nitro; m is a number having a value in the range of 1 to 2; and n is a number having a value in the range of 0 to 1, (2) from about 20 to about 95% of another photopolymerizable polyfunctional ethylenically unsaturated compound and (3) an effective amount of a photoinitiator.

4,277,320
PROCESS FOR DIRECT THERMAL NITRIDATION OF SILICON SEMICONDUCTOR DEVICES

Moiz M. E. Beguwala, Placentia, and Francis M. Erdmann, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 1, 1979, Ser. No. 80,859
Int. Cl.[3] C01B *21/068;* B05D *3/06;* H01L *7/00*
U.S. Cl. 204—164 8 Claims


PROVIDE SILICON WAFER
REMOVE NATIVE OXIDE FROM SURFACE
SUBJECT TO PURE, LOW PRESSURE N_2
IONIZE N_2 TO GROW NITRIDE LAYER
REMOVE FROM N_2
ANNEAL

1. A method of forming a high purity silicon nitride layer on a major surface of a silicon semiconductor body comprising the steps of:

removing the native oxide from the surface of the silicon semiconductor body by subjecting the body to a hydrogen atmosphere;

subjecting said silicon semiconductor body to an atmosphere entirely comprising substantially pure N_2;

ionizing said atmosphere for a predetermined period of time so that the nitrogen is ionized;

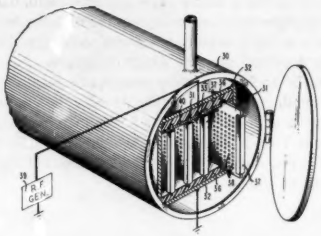
chemically reacting the nitrogen ions with silicon on the surface of said silicon semiconductor body so that the nitrogen ions and the silicon combine to form a layer of silicon nitride on the body; and

removing said silicon semiconductor body from said nitrogen atmosphere.

4,277,321
TREATING MULTILAYER PRINTED WIRING BOARDS

Charles J. Bartlett, Madison; Ronald J. Rhodes, South Plainfield, and Ray D. Rust, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 32,339, Apr. 23, 1979, Pat. No. 4,230,553. This application Jan. 17, 1980, Ser. No. 113,117
The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—192 E 4 Claims

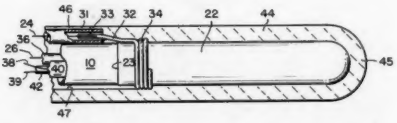


1. A process for treating a laminated structure having metal layers separated by an insulating layer, and holes therethrough, comprising the steps of placing the structure in a partially evacuated chamber containing a gas comprising oxygen, making electrical contact to at least some of the metal layers, and applying an electric field to the contacts so as to create a gas plasma that extends into the holes.

4,277,322
OXYGEN SENSOR

William T. Kane, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,480
Int. Cl.[3] G01N *27/58*
U.S. Cl. 204—195 S 10 Claims



1. An oxygen sensor comprising

a tubular body having a closed end and an opposite open end,

an electroded portion of the body including the closed end and comprising a solid oxygen-ion-conducting electrolyte with metal film electrodes attached on the outer and inner surfaces of the electrolyte,

a compressible, porous, ceramic boot firmly press-fit onto and over the electroded portion in slidable and frictional engagement with the electrode on the outer surface of the electrolyte so as to maintain contact between the electrolyte and the electrode on the outer surface of the electrolyte and to maintain the electrical conducting function of that electrode, and

the ceramic of the boot being nonreactive with the metal electrode in contact with the boot.

4,277,323
ELECTROCHEMICAL OXYGEN SENSOR, PARTICULARLY FOR USE IN THE EXHAUST SYSTEM OF AUTOMOTIVE-TYPE INTERNAL COMBUSTION ENGINES

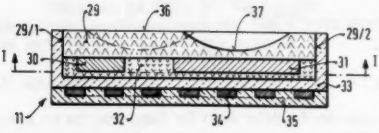
Klaus Muller, Tamm; Helmut Maurer, Schwieberdingen; Ernst Linder, Mühlacker; Franz Rieger, Aalen, and Bodo Ziegler, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,600

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909201

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—195 S **11 Claims**



1. Electrochemical oxygen sensor, and particularly to determine the oxygen content in the exhaust gases in a combustion process, for example from an internal combustion engine comprising

an electrically insulated elongated carrier plate (**29**) having one end portion exposed to the gases, said carrier plate being of a material pervious to oxygen molecules;

a layer of solid electrolyte material (**32**) secured to the carrier plate on one major surface thereof, said carrier plate providing both a support substrate and a path for oxygen molecules to said layer electrolyte material;

layer-like electrodes embedded in the solid electrolyte material and located on one major surface of the insulating carrier plate;

insulating connecting paths (**30/1, 31/1**) connected to said electrodes and extending to the other end portion of the carrier plate to permit electrical connection thereto;

and a gas-impervious insulating cover (**33**), applied to the major side of the solid electrolyte body remote from its side which is secured to the carrier plate, and entirely covering the surfaces of the solid electrolyte body not facing said carrier plate.

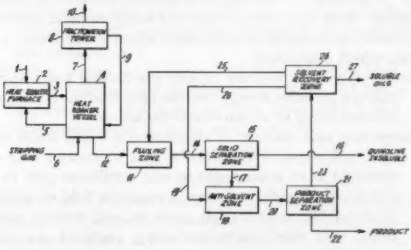
4,277,324
TREATMENT OF PITCHES IN CARBON ARTIFACT MANUFACTURE

Sydney H. Greenwood, Sarnia, Canada, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 13, 1979, Ser. No. 29,760

Int. Cl.³ C10C *1/18, 3/08*

U.S. Cl. 208—45 **16 Claims**



1. A process for treating carbonaceous graphitizable pitches comprising:

adding an organic fluxing liquid to a carbonaceous graphitizable pitch to provide a fluid pitch containing insoluble solids suspended therein, said solids including substantially all the quinoline insoluble solids present in the pitch, said organic fluxing liquid being added in an amount sufficient to lower to viscosity of the pitch whereby the fluid pitch is capable of flowing through a 0.5 micron filter with suction filtration;

separating said fluid pitch from said solids;

treating said separated fluid pitch with an organic liquid to precipitate at least a substantial portion of said pitch; and,

separating the precipitated pitch from said organic liquid whereby a pitch free of quinoline insoluble solids is obtained.

10. A process for treating a thermal or cracked residuum of a petroleum origin capable of being thermally converted to an optically anisotropic phase comprising:

heating said residuum at temperatures in the range of from about 350° C. to about 450° C. at least until polarized light microscopic examination of samples of said heated residuum indicate the formation of optically anisotropic spherules therein;

terminating said heating and adding an organic fluxing liquid to said heated residuum to provide a fluid pitch containing insoluble solids suspended therein, said solids including substantially all the quinoline insoluble solids present in said heated residuum;

separating said solids from said fluid pitch;

treating said separated fluid pitch with an organic solvent system having a solubility parameter at 25° C. of between about 8.0 and about 9.5, said treating being at a temperature and with an amount of organic solvent system sufficient to provide a solvent insoluble fraction which is thermally convertible into a deformable pitch containing greater than 75% of an optically anisotropic phase; and,

separating said solvent insoluble fraction from said solvent system.

4,277,325
TREATMENT OF PITCHES IN CARBON ARTIFACT MANUFACTURE

Sydney H. J. Greenwood, Sarnia, Canada, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 29,760, Apr. 13, 1979. This application May 2, 1980, Ser. No. 146,157

Int. Cl.³ C10C *3/16*

U.S. Cl. 208—45 **7 Claims**

6. In the process of preparing a pitch suitable for carbon artifact manufacture wherein a carbonaceous isotropic graphitizable pitch is fluxed with an organic fluxing liquid to provide a fluid pitch having insoluble solids suspended therein and wherein said solvent insolubles are separated from said fluid pitch and said fluid pitch is thereafter treated with an organic solvent system having a solubility parameter at 25° of between about 8.0 and 9.5 in an amount sufficient to provide a solvent insoluble fraction thermally convertible into a deformable pitch containing greater than 75% of an optically anisotropic phase, the improvement comprising treating said fluid pitch with from 5% to 15% of said solvent system in a first stage, separating the solid formed in said first stage, and thereafter treating the remainder of the fluid pitch in a second stage with from about 85% to 95% of the organic solvent system to provide a solvent insoluble fraction, and thereafter separating said solvent insoluble fraction.

4,277,326
OXYGEN ALKYLATION OF PHENOL-CONTAINING HYDROCARBONACEOUS STREAMS

Richard H. Schlosberg, New Providence, and Charles G. Scouten, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 19, 1979, Ser. No. 95,641
Int. Cl.³ C10G *19/08*; C07C *41/00*
U.S. Cl. 208—263 **28 Claims**

1. A process for improving the properties of phenol-containing coal liquids by oxygen-alkylation which process comprises contacting the coal liquid with:

(a) a multivalent metal composition selected from the group consisting of oxides and/or hydroxides of one or more multivalent metals capable of forming hydroxy metal phenates with phenols of the coal liquid, wherein said contacting is performed at temperatures lower than the decomposition temperature of the hydroxy metal phenates; and

(b) one or more alkylating agents represented by the formula RX where R is a C_1 to about C_{18} group selected from the group consisting of alkyl, allyl, cycloalkyl, haloalkyl, benzyl and arylalkyl, provided X is located on the alkyl portion of the alkylating agent and X is sulfate or a halide selected from the group consisting of chlorine, bromine and iodine.

4,277,327
TREATMENT OF PHENOL-CONTAINING FEED STREAMS

Richard H. Schlosberg, New Providence, and Martin L. Gorbaty, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 19, 1979, Ser. No. 95,642
Int. Cl.³ C10G *19/08*; C07C *41/00*
U.S. Cl. 208—263 **13 Claims**

1. A process for improving the properties of coal liquids by oxygen-alkylation comprising contacting the coal liquid at a temperature less than about 100° C. with:

(a) an aqueous base solution comprised of an alkali or alkaline-earth metal oxide or hydroxide or mixtures thereof, wherein the base solution is capable of removing the acidic protons of the phenolic and carboxylic functionality of the coal liquid and forming the corresponding metal phenate salt; and

(b) one or more alkylating agents represented by the formula RX where R is a C_1 to about C_{18} group selected from the group consisting of alkyl, allyl, cycloalkyl, haloalkyl, benzyl and arylalkyl, provided X is located on the alkyl portion of the alkylating agent and X is sulfate or a halide selected from the group consisting of chlorine, bromine and iodine.

4,277,328
FLOTATION APPARATUS FOR SEPARATING IMPURITIES FROM A FIBER SUSPENSION

Lothar Pfalzer, and Siegbert Fischer, both of Heidenheim, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 123,013
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906599
Int. Cl.³ B03D *1/20*
U.S. Cl. 209—169 **24 Claims**

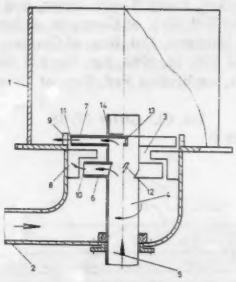
1. Flotation apparatus for removing ink, or the like, from a fiber suspension formed from waste paper, the apparatus comprising:

a container in which the fiber suspension is to be floated; the container having a lower region;

a drive shaft; a pump impeller on the drive shaft for pumping suspension from the lower region of the container;

a feed opening for the suspension located in the lower regin of the container and discharging from the lower region of the container into the region of the pump impeller in the container;

an air feed conduit into the container; the air feed conduit having an outlet therefrom;

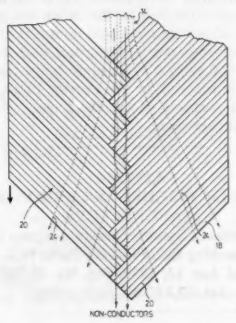


a rotor on the drive shaft for dispersing the air introduced into the container by the air feed conduit; the rotor being located downstream of the impeller along the drive shaft in the direction of flow of suspension into the container; the air feed conduit outlet being in the region of the rotor.

4,277,329
INDUCTION BELT SEPARATION

Patrick E. Cavanagh, Toronto, Canada, assignor to Maghemite Inc., Mississauga, Canada

Filed Aug. 10, 1979, Ser. No. 65,460
Claims priority, application United Kingdom, Oct. 3, 1978, 39108/78
Int. Cl.³ B03C *1/22*
U.S. Cl. 209—212 **10 Claims**



1. A method of separating electrically-conducting mineral particles from non-electrically-conducting mineral particles, said particles having a particle size of about −8 to about +325 mesh, which comprises:

conveying a dry mixture of said conducting and non-conducting particles along a substantially rectilinear path, said mixture being of uniparticular thickness,

subjecting said mixture to alternate north and south magnetic poles spaced apart about 1/32 to about 1 inch and arranged at an acute angle to said rectilinear path in the conveying direction to exert a magnetic field of strength of about 100 to about 800 gauss on said mixture and to cause said electrically-conducting particles to rotate towards the next successive magnetic pole and assume a path of movement out of said rectilinear path and towards said angle while said non-conducting particles remain undeflected in said rectilinear path, said rectilinear path

being about 5 to about 10 percent of the width of the magnetic field,

said deflected particles having a diameter which is less than or equal to about 0.637 times the magnetic pole spacing and said deflected particles of greater particle size being deflected from said rectilinear path to a greater extent than said deflected particles of smaller particle size, and

separately collecting at least one stream of deflected particles and at least one stream of undeflected particles.

4,277,330

SPIRAL SEPARATORS

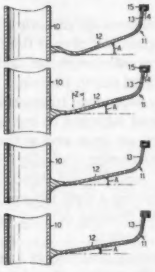
Douglas C. Wright, Terranora, and Sidney N. Roberts, Banora Point, both of Australia, assignors to Inheed Pty. Ltd., New South Wales, Australia

Filed Jan. 29, 1980, Ser. No. 116,629

Claims priority, application Australia, Feb. 5, 1979, PD7563; Mar. 15, 1979, PD8074; Aug. 7, 1979, PD9920

Int. Cl.³ B03B *5/52*

U.S. Cl. 209—459 **6 Claims**



1. A spiral separator supported with its axis substantially vertical which is adapted to receive at an upper end thereof a pulp of water and minerals to be separated, said spiral separator including:

a plurality of helical turns wherein the bottom of each turn in cross section includes a substantially straight or flat portion and an outer portion, said straight portion being inclined at an angle to horizontal and said outer portion being inclined upwardly relative to the straight portion, characterized in that the angle to horizontal of the straight portion of each or adjacent groups of turns progressively decreases from top to bottom throughout at least a major part of the length of the spiral separator to thereby develop a braking effect on the flow of pulp which comprises heavy particles, light particles and intermediate size particles, whereby the flow of light particles throughout the said substantial part of the spiral separator is gradually shifted outwardly from the flow of heavy particles and intermediate size particles to facilitate subsequent separation of the light particles from said heavy and intermediate size particles; and

dividing means for dividing said light particles from said heavy particles and intermediate particles and means for withdrawing said light particles from said heavy and intermediate size particles separately.

4,277,331

ONE-STAGE FLOTATION PURIFICATION OF NAOH

Raymond H. Conageski, Montague, Mich., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

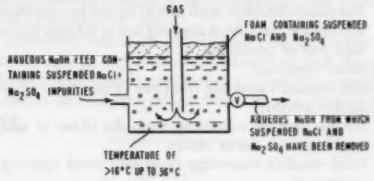
Filed Jun. 14, 1979, Ser. No. 48,590

Int. Cl.³ B03D *1/02*

U.S. Cl. 23—293 R **7 Claims**

1. A process for purifying an aqueous solution containing less than 52 weight percent of NaOH by removing suspended NaCl and Na_2SO_4 impurities, comprising:

(i) bubbling a gas into the impurity-containing NaOH solution at a temperature above 16° C. up to about 36° C., to


GAS
FOAM CONTAINING SUSPENDED NaCl AND Na_2SO_4
AQUEOUS NaOH FEED CONTAINING SUSPENDED NaCl + Na_2SO_4 IMPURITIES
AQUEOUS NaOH FROM WHICH SUSPENDED NaCl AND Na_2SO_4 HAVE BEEN REMOVED
TEMPERATURE OF >16°C UP TO 36°C

transport suspended impurities to the surface of the NaOH solution and form a surface foam layer on the NaOH solution; and

(ii) separating the surface foam layer of impurities from the NaOH solution.

4,277,332

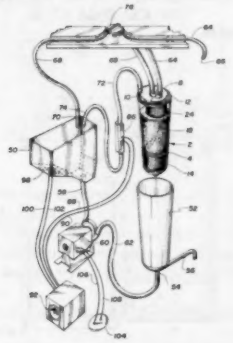
WATER PURIFIER

John W. Baughn, Saline, Mich., assignor to Gelman Sciences, Inc., Ann Arbor, Mich.

Filed Mar. 10, 1980, Ser. No. 128,596

Int. Cl.³ B01D *15/04, 23/14, 31/00*

U.S. Cl. 210—96.2 **10 Claims**



6. A water purification device comprising:

an elongated cylindrical housing having an entrance opening at the bottom end thereof for entrance into said housing of the water to be purified and having an upper wall at the top end thereof; a water-permeable layer of particulate charcoal in said housing; a water-permeable layer of particulate ion-exchange resin in said housing above said layer of particulate charcoal; a cylindrical water-permeable filter membrane having a pore size of less than 0.5 microns secured and sealed at its upper end to said upper wall of said housing and sealed at its lower end by a round impermeable plate, said cylindrical filter membrane and round plate having a diameter less than that of said housing thereby providing a space exterior of said cylindrical membrane, between said housing and said cylindrical membrane, separated by said membrane from the space interior of said cylindrical membrane whereby water in said housing exterior of said cylindrical membrane can reach the space interior of said membrane only by passage through said membrane; said upper wall of said housing having a pair of openings therethrough adjacent the center thereof communicating with the space interior of said cylindrical membrane for exit from said housing of water

which has passed through both of said layers and through said membrane, and said upper wall having a third opening therethrough adjacent the periphery thereof which communicates with said space between said membrane and said housing for exit from said housing of water which has passed through both of said layers but not through said membrane, said third opening being smaller than either of said pair of openings;

a water reservoir;

a first conduit extending from one of said pair of openings to said reservoir;

a second conduit extending from the other of said pair of openings to a water outlet;

a third conduit extending from said third opening to said reservoir;

conduit means extending from said reservoir to the entrance opening on the bottom end of said housing;

a pump for pumping water from said reservoir into and through said housing;

valve means operatively associated with said first and second conduits for closing one of said first and second conduits and opening the other of said first and second conduits; and

an electrical conductivity cell in one of said conduits extending from said housing to said reservoir to measure the electrical resistivity of the water flowing therethrough.

4,277,333

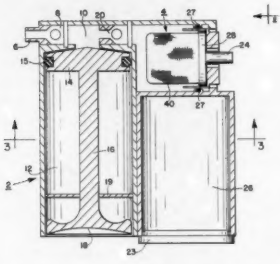
PORTABLE WATER FILTRATION SYSTEM

Peter J. Coppola, Two Garrity Rd., Burlington, Mass. 01803

Filed Sep. 18, 1979, Ser. No. 76,572

Int. Cl.³ B01A *27/08*

U.S. Cl. 210—136 **1 Claim**



1. A portable water filtration system comprising

a pump having a cylinder, a piston and an actuating handle,

an inlet port communicating with said cylinder,

a first check-valve means positioned between said inlet port and said cylinder and arranged to permit the unidirectional flow of water into said cylinder,

removable filter means positioned adjacent to and laterally displaced from the longitudinal axis of said cylinder,

an outlet duct communicating with said cylinder and said filter means,

a second check-valve means positioned in said outlet duct and arranged to permit the unidirectional flow of water from said cylinder,

a storage chamber having rigid walls and being positioned adjacent and rigidly secured to said cylinder with its longitudinal axis extending substantially parallel with the longitudinal axis of said cylinder, whereby the storage chamber mechanically reinforces said pump, and

an integral unitary body having a first cavity joining said cylinder, a second cavity forming said storage chamber, and a third cavity adapted to removably retain said filter means, said filter means being positioned substantially along a common axis displaced laterally from the longitudinal axis of said cylinder.

4,277,334

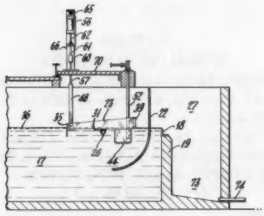
OIL AND DEBRIS SKIMMER

Louis E. Ruidisch, Fishkill, and Sterling O. Van Wagenen, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,583

Int. Cl.³ B01D *35/08*

U.S. Cl. 210—154 **1 Claim**



1. An automatic oil and debris skimmer, comprising in combination

a rectangular channel for directing the flow of contaminated water for separation of said floating oil and debris,

a weir at the downstream end of said channel for maintaining a predetermined depth therein,

a tray pivotally supported transversely relative to said channel and located adjacent to but upstream from said weir,

said tray having an open end at the upstream side and said pivotal support being centrally located between said open end and the opposite end thereof,

said tray also having a well adjacent to said opposite end for receiving said floating oil and debris when tipped about said pivotal support,

means for mounting said tray in a normal attitude parallel to and beneath the surface of said contaminated water in said channel for skimming said floating oil and debris as said water flows toward said weir,

a yoke pivotally attached to said tray adjacent to said open end,

a reciprocating piston mounted above said channel and attached to said yoke for periodically raising said yoke to tip said tray about its pivotal support to wash said skimmed oil and debris into said well,

a suction pipe extending into said well for removing said oil and debris, and

a baffle between said tray and said weir for retaining any debris which may pass downstream of said tray.

4,277,335

EXPANSION AND CONTRACTION DRIVE APPARATUS

Mitutaka Hori, 3128-5, Koizumi-cho, Yamatokohriyama-shi, Nara-ken, Japan

Filed May 8, 1979, Ser. No. 37,093

Claims priority, application Japan, Aug. 11, 1978, 53-111413[U]

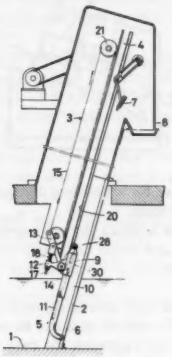
Int. Cl.³ E02B *5/08*

U.S. Cl. 210—159 **2 Claims**

1. In an elongated dirt remover for submerging in an effluent, said dirt remover having upper and lower ends, a bar screen (2) extending between said ends, a rake claw (6) normally held at said dirt remover lower end, disposed for longitudinal movement between said dirt remover upper and lower ends along said screen to remove unwanted dirt deposited thereon, an elongated endless first moving means (15) including a drive therefor, said first moving means being disposed for connection to said rake claw (6) for moving said rake claw, and telescoping means with upper and lower ends coupling said rake claw (6) and said first moving means (15), in combination:

link means (12, 13, 17) including a driver (14) connecting said first moving means lower end to said telescoping

means upper end; at least upper and lower telescoping pipes extending between said first moving means lower end and said rake claw, the outer periphery of one pipe being sized to just fit and slide within the inner periphery of the other pipe, and, cascaded second moving means with upper and lower ends disposed in at least two of said pipes, said second moving means (**22, 23**) each consisting of an endless tension member (**27**) extended between upper and lower guide wheels (**26**) one of the cascaded second moving means being longitudinally disposed in



each pipe, the lower guide wheel of the upper of said cascaded second moving means being disposed adjacent to the second moving means of said lower telescoping pipes said lower guide wheel having a spindle fixed to a part of said endless tension member of said lower pipe, the guide wheel of the uppermost pipe having a spingle (**28**) coupled to said driver (**14**), by tranmission means (**30**), and, rack and pinion means (**20, 19**) operatively coupled to driver (**14**), spindle (**28**) and the transmission means (**30**) so as to telescope the pipes.

4,277,336

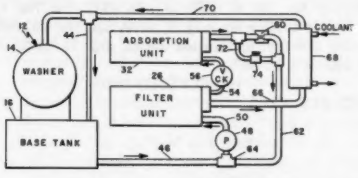
MULTIPLE BY-PASS FILTER SYSTEM

Arthur O. Henschel, Jr., 1031 Roosevelt, National City, Calif. 92050

Continuation of Ser. No. 921,819, Jul. 17, 1978, abandoned. This application Jan. 11, 1980, Ser. No. 111,332

Int. Cl.³ B01D *27/04, 37/02*

U.S. Cl. 210—167 **5 Claims**



1. A continuous flow multiple pass filtering system for filtering dry cleaning fluid from a dry cleaning washer comprising in combination:

a mechanical filter including a chamber having an inlet and an outlet and at least one filter element between said inlet and said outlet,

a pump for supplying fluid directly to the inlet of said mechanical filter,

an adsorption filter including a chamber having an inlet communicating with the outlet of said mechanical filter, an outlet and at least one filter element between said inlet and said outlet, and

first conduit means for diverting at least a portion of fluid from the outlet of said mechanical filter to the inlet of said adsorption filter chamber,

second conduit means for communicating the outlet from said adsorption filter directly to the inlet to said pump for recirculating the fluid from the adsorption filter through the mechanical filter, and

fixed restricting means in said second conduit means for maintaining a predetermined minimum flow rate through said adsorption filter by controlling the fluid flow between the outlet of said adsorption filter and the inlet to said pump.

4,277,337

DEPOSIT FILTERING APPARATUS FOR FILTERING TURBID LIQUIDS

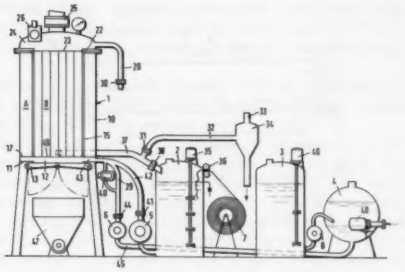
Ewald Zdansky, Vaduz, Liechtenstein, assignor to Hoval Interliz AG, Vaduz-Neugut, Liechtenstein

Filed Jun. 9, 1980, Ser. No. 157,436

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 2923010

Int. Cl.³ B01D *37/02*

U.S. Cl. 210—173 **9 Claims**



1. A deposit filtering apparatus for filtering turbid liquids, said apparatus comprising:

an essentially cylindrical, vertical filter container which includes turbid-liquid chambers and a filtrate chamber;

a first conduit for supplying turbid liquid to said turbid-liquid chambers;

a second conduit for discharge of filtered liquid from said filtrate chamber;

a packet of vertically arranged sieve-like, plate-shaped filter elements arranged as a removable unit in said filter container between said turbid-liquid chambers and said filtrate chamber, with said filtrate chamber surrounding the sides of said packet, said packet being closed on its four vertical sides and being tightly connected with said filter container on its upper and lower edges by means of an intermediate cover and intermediate bottom respectively, so that between said cover and bottom said filtrate chamber is separated from said turbid-liquid chambers, said filter elements being plane parallel to, and spaced from, one another to form said turbid-liquid chambers, said last mentioned chambers being open toward the top and bottom, and being tightly closed relative to said filtrate chamber by vertical spacer strips located between the vertical edges of said filter elements, with the upper and lower horizontal faces of said filter elements being tightly closed, while the vertical faces thereof are opened to said filtrate chamber between said spacer strips, that side of said filter elements facing the pertaining turbid-liquid chamber being provided with a detachable filter membrane covering formed by deposit on said element of a suspension agent which aids filtering, said filter container having a substantially flat bottom below said filter element packet, said bottom being provided with a closable qua-

dratic opening to allow removal of filter cakes which comprise filter aiding agent and impurities and which were built up and separated from said filter elements, the cross section of said quadratic bottom opening corresponding to the entire horizontal cross section of said filter element packet; and

a bottom flap connected to said filter container for tightly closing said quadratic bottom opening.

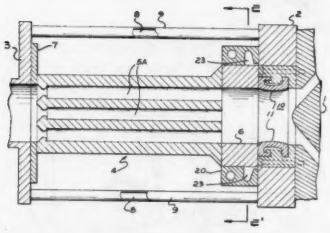
9. An apparatus according to claim **1**, which includes: a preparation container for a fiber suspension, said last mentioned container being connected to a paper supply roll and being provided with a stirring mechanism having knife-like sharp blades for tearing up a paper web introduced into said preparation container; and a fourth conduit connecting said turbid-liquid chambers with said preparation container.

4,277,338

FILTER ASSEMBLY

John C. Hoagland, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 6, 1979, Ser. No. 101,023
Int. Cl.³ B01D *27/08, 29/02, 35/18;* **F16L** *17/00*
U.S. Cl. 210—186 **5 Claims**



1. A filter assembly which comprises

(A) a housing interposed between opposed, aligned end surfaces of a polymer melt inlet manifold and a polymer melt outlet manifold;

(B) at least two filter pods, each containing a plurality of filter elements, the pods being retained within said housing in side-by-side relationship, and adapted to be moved successively into tight register with inlet and outlet manifolds to define alternate polymer melt flow paths and a plurality of intermediate polymer melt flow paths in which varying proportions of adjacent pods are utilized;

(C) a primary seal device, located in a rabbet at at least one of the interfaces of the inlet and outlet manifolds with the housing, and having a cross-section the outer surface of which is generally U-shaped, the dimensions of the device being such that

(i) the convex surface of the device defines part of the polymer melt path,

(ii) one outer surface of the member providing one leg of the U-shape bears against the wall of the rabbet, and

(iii) the surface providing the other leg of the U-shape provides a sealing surface which bears against an opposed wall to form a seal between the housing and the manifold, the tightness of which is determined in part by the pressure exerted in use by the melt flow on the convex surface of the device,

(D) means for achieving a controlled movement of the filter pods into successive exclusive register with the inlet and outlet manifolds; and

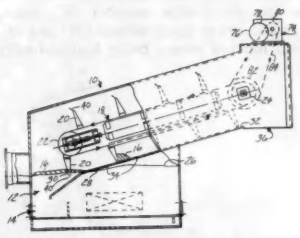
(E) means connecting inlet and outlet manifolds adapted to urge the manifolds axially towards and away from each other so as to tighten the seal at the interfaces of the manifolds and the interposed housing.

4,277,339

PAINT PIGMENT SKIMMER

Michael J. Quin, 12667 Farley, Detroit, Mich. 48239

Filed Nov. 26, 1979, Ser. No. 97,484
Int. Cl.³ B01D *29/04, 29/38*
U.S. Cl. 210—413 **7 Claims**



1. An apparatus for separating pigment containing cake from a vehicle comprising:

a reservoir for holding the cake containing vehicle;

a continuous conveyor belt supported within the reservoir inclined upward from a surface of the cake containing vehicle;

at least one outward extending wall attached the belt including a pair of opposed ends and an outer edge, said outward extending wall engaging the cake containing vehicle at a lower end of the belt;

an inclined wall supported within the reservoir disposed parallel to and spaced below the belt slidingly engaging the outer edge;

a discharge opening formed at an upper end of the inclined wall;

a pair of opposed vertical walls affixed the inclined wall;

a pair of opposed vertical resilient walls attached the opposed ends slidingly engaging the opposed vertical walls; and

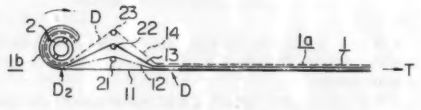
wherein cake is collected from the vehicle at a lower end of the belt and moved along the inclined wall by the outward extending wall and discharged through the discharge opening.

4,277,340

MEMBRANE SEPARATION MODULE AND APPARATUS FOR ITS PRODUCTION

Naokatu Kanamaru, Kyoto; Kazuo Imai, Moriyama, and Hisaaki Fujino, Hikone, all of Japan, assignors to Toray Industries, Inc., Japan

Division of Ser. No. 815,284, Jul. 13, 1977, Pat. No. 4,132,113. This application Aug. 9, 1978, Ser. No. 932,399
Claims priority, application Japan, Jul. 13, 1976, 51-82486; Mar. 29, 1977, 52-34930
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—433.2 **11 Claims**



10. In a spiral-type liquid separation module for use in semipermeable membrane separation apparatus, comprising a hollow mandrel having at least one hole in its outer circumference, and a sheet layer arrangement which, viewed in transverse cross section, comprises a plurality of pairs of semipermeable membrane sheets and a plurality of first and second

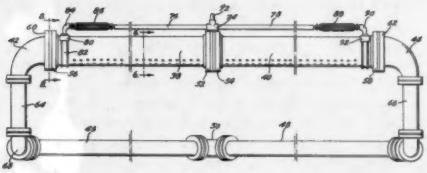
spacing layers forming first passages for carrying a permeated solution and second passages for carrying a feed solution, said first spacing layers being disposed between said membrane sheets and said second spacing layers being disposed between the outer surfaces of said respective membrane sheets, wherein said layer arrangement is spirally and tightly wound about said mandrel to form said first and second passages in spiral form, said first passages being closed at their respective radially outermost ends and open at their respective radially innermost ends to communicate with the interior of said mandrel through said hole, and said second passages being closed at their respective radially innermost ends and open at their respective radially outermost ends,

the improvement characterized in that a single semipermeable membrane sheet having a plurality of folds extending parallel and adjacent to the axis of said mandrel is provided, wherein each of said folds forms one of said pairs of membrane sheets, and wherein the axially extending ends of said single membrane sheet are joined to form said sheet into a continuous loop, when viewed in transverse cross section, with said second spacing layers being located outside the loop and said first spacing layers and said mandrel being located inside the loop.

4,277,341
WATER TREATMENT DISCHARGE MEANS

William F. Wise, Weyers Cave, and Jesse E. Snyder, Jr., Staunton, both of Va., assignors to Schramm, Inc., West Chester, Pa.

Filed Sep. 6, 1979, Ser. No. 73,029
Int. Cl.³ C02F 3/10
U.S. Cl. 210—602 **18 Claims**

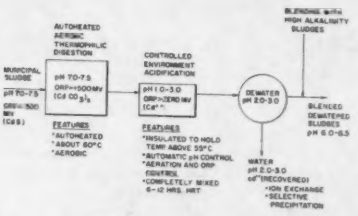


17. A method of water treatment comprising directing water into an open body of water, maintaining a substantially uniform water level therein, establishing a substantially quiescent zone in said body extending from the floor to the surface thereof, and discharging water from said body through a collector located in said quiescent zone, said collector comprising at least one elongated, substantially horizontal tube, each tube having an array of openings providing communication between its exterior and its interior, substantially all of said openings in each tube being confined to the underside of the tube and being of substantially uniform cross-sectional area, the cross-sectional area of each opening and the total cross-sectional area of all of the openings being such that, at the rate of flow of water through said collector, the velocity gradient at each opening is less than approximately 200 sec^{-1}, and the openings being distributed over an area on each tube such that the total area is substantially greater than the cross-sectional area of the discharge conduit, each tube being located with its entire array of openings submerged to a depth below the algal zone in said body and within said quiescent zone, and each tube having packing material within its interior providing labyrinthine passages adjacent substantially all of its openings for promoting uniformity of flow of water through the openings into the interior of the tube.

4,277,342
COMBINED BIOLOGICAL-CHEMICAL DETOXIFICATION OF ORGANICS

Thomas D. Hayes, Trumansburg, and William J. Jewell, Ithaca, both of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,558
Int. Cl.³ C02F 11/02, 11/12
U.S. Cl. 210—609 **11 Claims**



1. A combined biological-chemical method for detoxifying a slurry of sludge of the municipal sewage or industrial organic type, which sludge contains excess-waste thermophilic bacteria, biodegradable organic material, sulfur, and toxic heavy metals in insoluble form, which comprises the sequential steps of:

(a) introducing a sufficient quantity of the sludge slurry into an enclosed insulated reactor vessel to fill the same to about one-half of its volume;

(b) aerating the slurry with ambient air by means of a self-aspirating aerator, and simultaneously cutting foam produced thereby, thereby to effect autoheating of the slurry by the thermophilic bacteria to a temperature maintained in the thermophilic range of from about 43° C. to about 70° C., said autoheating being achieved by conservation of the metabolic heat of oxidation of the biodegradable organic material in said insulated reactor vessel;

(c) retaining said autoheated slurry in said reactor for a hydraulic retention time of 3 to 8 days sufficient to destroy the pathogenic bacteria and increase the oxidation reduction potential to a level greater than +500 mv, whereby the sulfur and heavy metals are converted to a desired higher oxidation state;

(d) adding to said autoheated slurry a quantity of concentrated acid in an amount sufficient to acidify said slurry to a pH value ranging from 1.0 to 3.0 for an acidification period of 6 to 12 hours sufficient to solubilize the heavy metals while maintaining said oxidation reduction potential at a level greater than zero mv, and the temperature in the thermophilic range; and

(e) dewatering the acidified slurry to remove the solubilized heavy metals therefrom, thereby to produce dewatered, detoxified acidic sludge and acidic, heavy-metal-containing water.

4,277,343
METHOD FOR CONTINUOUSLY MONITORING AND CONTROLLING ALKALINITY FOR ENVIRONMENTAL PURPOSES USING A pCO_2 PROBE

Jacob D. Paz, 33 Riverside Dr., New York, N.Y. 10023

Continuation-in-part of Ser. No. 20,032, Mar. 13, 1979, abandoned. This application Sep. 7, 1979, Ser. No. 73,432
Int. Cl.³ C02F 5/06, 3/02, 1/52
U.S. Cl. 210—614 **16 Claims**

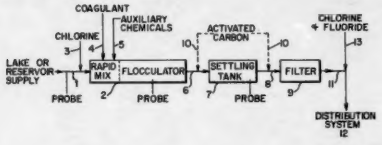
1. A method for continuously monitoring and controlling the total alkalinity attributable to carbon dioxide, bicarbonate ion and carbonate ion in an aqueous solution in which it is desirable to maintain alkalinity near a value customary for drinking water for environmental purposes,

said method comprising the steps of

(a) sampling the aqueous solution,

(b) in a closed system automatically adjusting the pH of the sample to a value of about 3.5,

(c) in a closed system detecting with a pCO_2 probe the total carbon dioxide of the pH-adjusted sample, the sample having been adjusted to and being maintained at a selected temperature value, and



(d) adding a sufficient amount of an alkalinity-controlling chemical to said solution to maintain alkalinity near a value customary for drinking water.

2. The method of claim **1** wherein the aqueous solution is in a water treatment system.

8. The method of claim **2** wherein the water treatment system is a waste water treatment system.

12. The method of claim **8** wherein said waste water treatment system is a biological nitrification system.

4,277,344

INTERFACIALLY SYNTHESIZED REVERSE OSMOSIS MEMBRANE

John E. Cadotte, Minnetonka, Minn., assignor to FilmTec Corporation, Minetonka, Minn.

Filed Feb. 22, 1979, Ser. No. 14,164

Int. Cl.[3] **B01D** *13/00, 31/00;* **B32B** *27/34, 33/00*

U.S. Cl. 210—654 **21 Claims**

1. A sheet-like composite material comprising a microporous support layer and, supported thereon, a crosslinked, water permeable, interfacially polymerized, ultrathin polyamide desalinizing layer, said desalinizing layer comprising the interfacial condensation reaction product of the components comprising:

(a) an essentially monomeric, aromatic, amine-reactive reactant comprising a polyfunctional acyl halide, the amine-reactive acyl halide groups of said polyfunctional acyl halide being capable of condensing with primary amine functional groups to form amide linkages in less than 60 seconds under normal ambient temperature and pressure; said polyfunctional acyl halide having at least three of said acyl halide groups substituted on an aromatic nucleus comprising less than 3 aromatic rings; said amine-reactive reactant being at least 0.01 weight percent soluble in liquid aliphatic or liquid halogenated aliphatic solvents; said aromatic nucleus being free of substituents capable of chemical interference with inter-molecular amide-forming condensation reactions;

(b) an essentially monomeric, aromatic, polyamine reactant having at least two primary-amine substituents substituted on an aromatic nucleus comprising less than 3 aromatic rings; the primary amine functionality of said aromatic polyamine reactant being no more than the carboxylic acid equivalent functionality of said polyfunctional acyl halide; said aromatic polyamine reactant having a solubility in water of at least 0.01% by weight and being free of substituents capable of chemical interference with inter-molecular amide-forming condensation reactions;

said polyamide layer having a lower percent elongation than the corresponding linear polymer; a molecular weight in excess of 100,000; a crosslink density of at least 1 per 100,000; a solubility in liquid organic amide, sulfoxide, and pyrrolidone solvents or solvent blends which is less than 10% by weight; a salt rejection capability, tested with simulated sea water under 40 to 70 atmospheres pressure and 25° C., of at least 85% at a flux of at least about 400 l/m^2d;

said polyamide layer including a plurality of sites having the formula $Ar(CONH-)_2COOH$, wherein Ar represents the aromatic nucleus residue of the polyfunctional acyl halide.

9. In a process for removing solute from solute-containing water in a single pass through a desalinizing layer, the step comprising passing said water through the sheet-like composite material of claim **1** to remove at least 65% of the solute therefrom.

10. A process for the preparation of a composite reverse osmosis membrane comprising the steps of:

(a) coating a porous support with a liquid layer comprising an aqueous solution containing, dissolved therein, an essentially monomeric, aromatic polyamine reactant having at least two primary amine substituents substituted on an aromatic nucleus comprising less than 3 aromatic rings; said aromatic polyamine reactant having a solubility in water of at least 0.01% by weight and being free of substituents capable of chemical interference with amide-forming reactions;

(b) contacting the said liquid layer with an essentially monomeric, armoatic, amine-reactive reactant comprising a volatilizable polyfunctional acyl halide, said polyfunctional acyl halide being selected such that the primary amine functionality of said aromatic polyamine reactant is no more than the carboxylic acid equivalent functionality of said polyfunctional acyl halide; the amine-reactive acyl halide groups of said polyfunctional acyl halide being capable of condensing with primary amine functional groups to form amide linkages in less than 60 seconds under normal ambient temperature and pressure; the aromatic nucleus of said acyl halide comprising less than 3 aromatic rings; said amine-reactive reactant being at least 0.01 weight percent soluble in liquid aliphatic or liquid halogenated aliphatic solvents; said aromatic nucleus of said polyfunctional acyl halide being free of substituents capable of chemical interference with intermolecular amide-forming condensation reactions; thereby interfacially condensing said amine-reactive reactant with said polyamine reactant, for an effective amount of interfacial condensation reaction time ranging up to about 60 seconds, until a crosslinked, interfacial polyamide layer has been formed, said polyamide having a plurality of sites having the formula $Ar(CONH—)_2COOH$, wherein Ar represents the aromatic nucleus of the polyfunctional acyl halide; and said polyamide having a solubility of less than 10% by weight in liquid organic amide, sulfoxide, and pyrrolidone solvents or solvent blends; and

(c) drying the product of step (b) to form a composite reverse osmosis membrane having a salt rejection capability, tested with simulated sea water under 40 to 70 atmospheres pressure and 25° C., of at least 85% at a flux of at least about 400 l/m^2d.

21. A composite reverse osmosis membrane made according to claim **10**.

4,277,345

METHOD FOR THE RECOVERY OF URANIUM DISSOLVED IN SEA WATER

Dieter Heitkamp, and Klaus Wagener, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 887,297, Mar. 16, 1978, abandoned. This application Dec. 4, 1979, Ser. No. 100,191

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711587

Int. Cl.[3] **C22B** *60/02;* **C02F** *1/42*

U.S. Cl. 210—679 **1 Claim**

1. A method of concentrating uranium ions naturally occur-

ring in sea water having a pH of 8.3, the method comprising the steps of:

suspending in the sea water an adsorbent matrix of humic acids and carrier material, said matrix being in the form of natural, biologically recent, chemically untreated black peat granules ranging in diameter from 0.1 mm to 10 mm said matrix being contained by a structure which admits sea water but retains the granules, the matrix having a degree of decomposition in the range of thirty-five percent to fifty-five percent, and the carrier material comprising up to ninety-nine percent of the matrix by weight;

providing relative motion between the matrix and sea water to adsorb the uranium ions onto the matrix and to thereby concentrate the uranium ions for subsequent removal.

4,277,346

TREATING AGENTS FOR WASTE WATER CONTAINING DYES AND/OR OTHER ORGANIC SUBSTANCES, A PROCESS FOR TREATING SAID WASTE WATER BY USING THE SAME

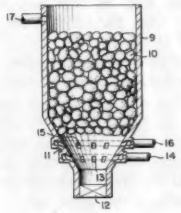
Akio Sakotani, and Tohru Gomi, both of Shizuoka, Japan, assignors to Heitaro Katsukawa, Tokyo, Japan

Filed Jun. 27, 1979, Ser. No. 52,642

Claims priority, application Japan, Jun. 27, 1978, 53/77045; Mar. 3, 1979, 54/26349[U]

Int. Cl.³ C02F *1/28*

U.S. Cl. 210—691 **8 Claims**



1. A treating agent for waste water containing dyes and/or other organic substances, which is a solid solution prepared by mixing as solids component A comprising a water-insoluble calcium salt and component B consisting mainly of aluminum hydroxide, aluminum oxide or a mixture thereof at a molar ratio of about 3:1 to 1:3 and heat-treating said mixture of components A and B at a temperature between 100° C. and 450° C.

5. A process for treating waste water containing dyes and/or other organic substances, comprising bringing said waste water into contact with a treating agent prepared by mixing component A comprising a water-insoluble calcium salts and component B consisting mainly of aluminum hydroxide, aluminum oxide or a mixture thereof at a molar ratio of 3:1 to 1:3 and heat-treating said mixture of components A and B at a temperature between 100° C. and 450° C.

4,277,347

METHOD FOR MAKING FLOTABLE, PARTICLES SUSPENDED IN A LIQUID BY MEANS OF GAS BUBBLES

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Netherlands

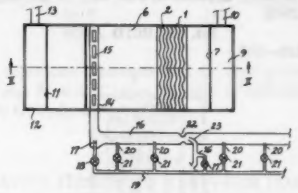
Filed Jun. 27, 1979, Ser. No. 52,556

Claims priority, application Netherlands, Jun. 30, 1978, 7807081

Int. Cl.³ C02F *1/24*

U.S. Cl. 210—704 **2 Claims**

1. A flotation method for separating particles suspended in a first carrier liquid to be treated by adhesion of gas bubbles to said particles in which said first liquid to be treated is conveyed along a first flow path towards an outlet in a flotation chamber and a second liquid which is saturated at an elevated pressure with a gas is conveyed along a second flow path, and is introduced after being depressurized to the pressure of the first liquid into said first liquid at a first inlet near said outlet, the abrupt pressure reduction causing the formation of small gas bubbles in said first liquid for flotating suspended particles by adherence to gas bubbles; the method comprising the steps of introducing the second liquid into the first flow path after



depressurization to the pressure of the first liquid at a plurality of additional inlets spaced along the length of the first flow path upstream of said first inlet to produce gas bubbles in said first liquid to ensure that the first liquid is sufficiently saturated with gas before the second liquid is introduced into the first liquid at said first inlet, thereby prolonging the life of the small bubbles to increase flotation of the particles.

4,277,348

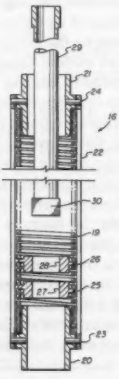
METHODS FOR CLEANING A HELICAL SPRING FILTER

Reynaldo Calderon, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 944,952, Sep. 22, 1978, Pat. No. 4,180,463. This application Jun. 4, 1979, Ser. No. 44,897

Int. Cl.³ B01S *35/02*

U.S. Cl. 210—791 **7 Claims**



1. A method for cleaning a helical spring filter having its convolutions spaced apart a predetermined distance for the passage of filtrate therebetween comprising,

(a) rotating an annular cleaning ring means between the adjacent helical spring convolutions from one end of the helical spring filter to the filter's other end for scraping off foreign material from between the spaced apart spring convolutions, and

(b) passing the filtrate axially through the middle of the annular ring means for continued filtering between the spring convolutions after being cleaned.

4,277,349
METHOD OF CLEANING PLATE-TYPE FILTER ELEMENTS LOCATED IN A TANK FILTER

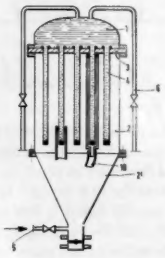
Günther Schwinghammer, Dortmund, Fed. Rep. of Germany, assignor to Holstein und Kappert GmbH, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 963,752, Nov. 27, 1978, Pat. No. 4,201,674. This application Aug. 27, 1979, Ser. No. 69,996

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1977, 2752906

Int. Cl.[3] B01D *23/06*

U.S. Cl. 210—797 2 Claims



1. Method of cleaning plate-type filter elements in a tank filter where the tank filter comprises an upper chamber for filtrate, a lower chamber for unfiltered liquid, a sheet separating the upper chamber from the lower chamber and a plurality of plate-type filter elements depending downwardly from the upper chamber through the sheet into the lower chamber with the filter elements made up of a plurality of discs stacked one on top of the other and forming microfine slots therebetween when the discs are pressed together, wherein the method comprises the steps of placing a tubular member around and laterally enclosing at least an axially extending portion of a plate-type element from the end of the element spaced downwardly from the sheet and forming an annular chamber about the exterior of the element with the inner surface of the annular chamber being defined by the exterior surface of the plate-type element and the outer surface being defined by the inner surface of the tubular member, sealing the upper end of the annular chamber between the exterior surface of the filter element and the laterally enclosing tubular member, and introducing a pressurized cleaning fluid directly into the lower end of the annular chamber for providing a body of the pressurized cleaning fluid in the annular chamber for flow directly inwardly from the annular chamber over the full annular and axial extent of the element within the laterally enclosed chamber so that the full pressure of the pressurized cleaning fluid within the annular chamber acts over the entire surface of the laterally enclosed portion of the element with the pressurized cleaning fluid flowing inwardly between the plates of the filter element in the same direction as normal filtering flow for dislodging any contamination between the plates.

4,277,350
TEXTILE SOFTENING AGENT

Yutaka Minegishi, Miyashiro, and Toshiro Nishimura, Wakayama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

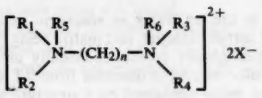
Filed Nov. 29, 1979, Ser. No. 98,685

Claims priority, application Japan, Dec. 5, 1978, 53-150290

Int. Cl.[3] D06M *13/46, 13/38*

U.S. Cl. 252—8.8 4 Claims

1. A softening agent for textile finishing comprising as an essential component 3–20% by weight of a quaternary ammonium salt represented by the formula,



wherein R_1, R_2, R_3 and R_4 each represent an alkyl group having 12 to 22 atoms, R_5 and R_6 each represent an alkyl group having 1 to 3 carbon atoms, X represents a halogen atom or a monoalkyl sulfate group containing an alkyl group having 1 to 3 carbon atoms, and n is an integer of 4 to 8.

4,277,351
METHOD FOR IMPROVING SULFONATE SURFACTANTS USED IN ENHANCED RECOVERY PROCESSING IN SUBTERRANEAN OIL-BEARING FORMATIONS

George W. Powers, Jr., Crown Point, Ind.; H. Robert Froning, and Davis L. Taggart, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 858,658, Dec. 8, 1977, abandoned. This application Dec. 20, 1979, Ser. No. 105,492

Int. Cl.[3] C09K *3/00*

U.S. Cl. 252—8.55 D 7 Claims

1. A process for preventing formation of sulfite impurities which impede the flow of sulfonated surfactants through subterranean formations which comprises contacting a sulfonate surfactant containing sulfite impurities with an aldehyde having from about one to about eighteen carbon atoms to complex said sulfite impurities wherein said aldehyde is present at a concentration of at least the stoichiometric amount necessary to complex the sulfite in the surfactant.

4,277,352
DEMULSIFICATION OF EMULSIONS PRODUCED FROM SURFACTANT RECOVERY OPERATIONS AND RECOVERY OF SURFACTANTS THEREFROM

Jean B. Allison; Mohan V. Kudchadker, both of Houston, and Lawrence E. Whittington, Katy, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 26, 1979, Ser. No. 24,000

Int. Cl.[3] E21B *43/22*

U.S. Cl. 252—8.55 D 4 Claims

1. In an enhanced recovery process for the recovery of oil from a subterranean oil-bearing formation employing the injection of an aqueous slug comprising a petroleum sulfonate surfactant whereby an emulsion of oil and water is produced containing said surfactant in the oil phase from said formation, the method of treating said produced emulsion with a water soluble solubilizing agent selected from the group consisting of water-soluble alcohols or polyhydric alcohols, alkoxylated phenols, alkoxylated alkyl phenols, alkoxylated alcohols, polyoxyalkylated mercaptans, sulfated or sulfonated derivatives of alkoxylated phenols, the sulfated or sulfonated derivatives of the alkoxylated alcohols and mixtures thereof, wherein said solubilizing agent is contained in an aqueous medium thereby extracting said surfactant from said emulsion and partitioning said surfactant into said aqueous medium, said aqueous medium being recycled to said oil-bearing formation to continue said enhanced recovery process.

4,277,353

OIL-SOLUBLE SUBSTITUTED MONO AND BICYCLIC OXAZOLIDINES, THEIR PREPARATION AND USE AS ADDITIVES FOR FUNCTIONAL FLUIDS

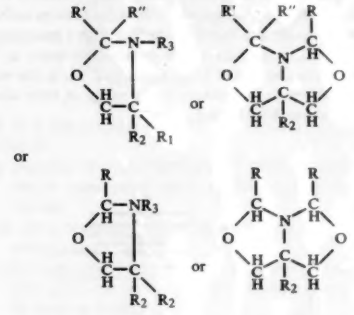
Harold E. Deen, Cranford; Rosemary O'Halloran, Union; Esther D. Winans, Colonia; Jack Ryer, East Brunswick, all of N.J., and Stanley J. Brois, Spring, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 7, 1980, Ser. No. 109,800

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 R **5 Claims**

1. A composition comprising a major amount of a functional fluid and a minor but at least a copper-corrosion inhibiting amount of an oil-soluble-4-alkyl mono- or 5-alkyl bicyclic oxazolidine characterized by the formulas:



or

wherein: R is hydrogen or a C_1 to C_{30} hydrocarbyl substituent group; R′ and R″ may be the same or different and each is a C_1 to C_7 hydrocarbyl substituent group; R_1 is hydrogen, methylol, methyl or ethyl; R_2 is methyl or ethyl; and R_3 is hydrogen or methyl.

4,277,354

OIL-SOLUBLE HYDROCARBYL SUBSTITUTED 1-AZA-3,7-DIOXABICYCLO[3.3.0]OCT-5-YL METHYL ALCOHOLS, AS ADDITIVES FOR FUNCTIONAL FLUIDS

Stanley J. Brois, Spring, Tex.; Jack Ryer, East Brunswick, and Esther D. Winans, Colonia, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

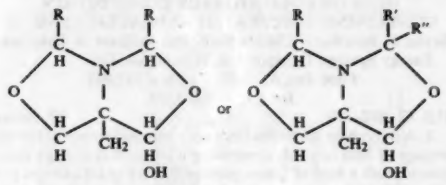
Continuation-in-part of Ser. No. 962,977, Nov. 22, 1978, which is a continuation-in-part of Ser. No. 752,872, Dec. 20, 1976, abandoned, and Ser. No. 752,873, Dec. 20, 1976, Pat. No. 4,069,023, which is a division of Ser. No. 573,545, May 1, 1975, Pat. No. 4,017,406. This application Jan. 7, 1980, Ser. No. 109,997

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 R **6 Claims**

1. A composition comprising a major amount of a functional fluid being an oil of lubricating viscosity and a minor but at least a copper-corrosion inhibiting amount of an oil-soluble hydrocarbyl substituted bicyclic oxazolidine.

2. A composition according to claim 1 wherein said functional fluid is an automatic transmission fluid comprising a major amount of a mineral lubricating oil and said oxazolidine is characterized by the formulas:



wherein R represents hydrogen and C_1 to C_{30} hydrocarbyl substituent and R′ and R″ may be same or different and are each a C_1 to C_7 hydrocarbyl group.

4,277,355

INSULATIVE FIREPROOF TEXTURED COATING

Alexander Farcnik, 2237 Hurley Way, Apt. No. 76, Sacramento, Calif. 95825

Continuation-in-part of Ser. No. 79,957, Sep. 28, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 192,073

Int. Cl.³ C04B *43/00, 43/08;* C09D *7/12, 1/04*

U.S. Cl. 252—62 **7 Claims**

1. An improved insulative fireproof liquid coating composition, said composition consisting essentially of:

a. 31 to about 34 volume percent of water as a vehicle;

b. granular, non-porous inorganic filler selected from the group consisting of silica-containing refractory material, calcium carbonate and mixtures thereof;

c. pollution-free water-soluble alkali metal silicate binder, the combined concentration of said water and said silicate being 41 to about 49 volume percent;

d. granular, porous thermoinsulating inorganic filler selected from the group consisting of lava rock, cinder slag and mixtures thereof; and

e. about 0.8–1.2 volume percent of liquid organic suspending agent comprising a vehicle having therein material selected from the group consisting of starch, paraffin, halogenated paraffin and mixtures thereof.

4,277,356

SOFT LITHIUM-TITANIUM-ZINC FERRITE

William Simonet, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 859,714, Dec. 12, 1977, Pat. No. 4,155,863. This application Jan. 17, 1979, Ser. No. 4,199

Claims priority, application France, Dec. 14, 1976, 76 37624

The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.

Int. Cl.³ C04B *35/26*

U.S. Cl. 252—62.59 **8 Claims**

1. A soft lithium-titanium-zinc ferrite having a resistivity of at least 10^7 ohm-cm measured at 20° C. and 100 volts, manufactured by forming a mixture of metal oxides and carbonates, crushing said formed mixture, calcining said crushed mixture in an air atmosphere at about 700° C. for about 2 hours, and sintering said calcined mixture in an oxygen-containing atmosphere at from 950° to 1100° C. for from 1 to 18 hours; wherein said mixture consists essentially of metal oxides and carbonates in proportions calculated as oxides which satisfy the formula

$$Li_aTi_tZn_zMn_mFe_bO_4+\beta Bi$$

wherein

$a=0.5(1+t-z)$

$b=0.5(5-3t-z-2m-5\epsilon)$

$0 \leqq t \leqq 0.08$

$0.50 \leqq z \leqq 0.60$

$0.005 \leqq m \leqq 0.035$

$0.02 \leqq \epsilon \leqq 0.06$

and β is from 0.0015 to 0.05 molar equivalent.

4,277,357

HEAT OR COLD STORAGE COMPOSITION CONTAINING A HYDRATED HYDRAULIC CEMENT

Bryan J. Boardman, Chadds Ford, Pa., assignor to Boardman Energy Systems Incorporated, Wilmington, Del.

Filed Jan. 31, 1980, Ser. No. 117,042
Int. Cl.[3] C09K 5/06
U.S. Cl. 252—70 87 Claims

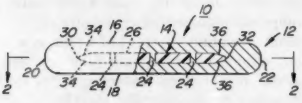
1. A polyphase latent heat storage composition useful for the storage of heat or cold, comprising a latent heat storage component with a heat of fusion greater than 16 gram calories per gram (67 joules per gram) wherein said latent heat storage component is intimately intermixed with a hydrated hydraulic cement component.

4,277,358

ENVIRONMENTALLY DEGRADABLE SOAP BAR SYSTEM

Lamar Hopkins, R.D. #1, Norristown, Pa. 19401

Continuation-in-part of Ser. No. 763,233, Jan. 27, 1977, abandoned. This application Sep. 19, 1979, Ser. No. 76,684
Int. Cl.[3] C11D 9/26, 10/06, 17/04
U.S. Cl. 252—92 8 Claims



1. An environmentally degradable soap bar system comprising:

(a) a soap bar having a predetermined contour;

(b) an insert member formed of an environmentally degradable composition and positionally located internal said soap bar, said insert member being formed from a water soluble plastic composition selected from the group consisting of hydroxypropyl cellulose, and polyethylene oxide, said insert member being dissolved subsequent to said soap bar being worn away thereby exposing said insert member to the external environment; and,

(c) means for securing said insert member to said soap bar independent of wear orientation imposed on said soap bar during use.

4,277,359

WATER TREATMENT TO INHIBIT CORROSION AND SCALE AND PROCESS

Richard J. Lipinski, Aurora, Ohio, assignor to Mogul Corporation, Chagrin Falls, Ohio

Filed Apr. 4, 1979, Ser. No. 13,254
Int. Cl.[3] C02B 5/06
U.S. Cl. 252—181 14 Claims

1. A water composition for treating water to inhibit scale and corrosion of metals exposed thereto which comprises a major amount of a water soluble polymer derived from acrylic acid characterized by having a molecular weight ranging up to about 2500 and having over 90% by weight of acrylic acid monomeric units; and an amount of phosphorous acid and the salts thereof effective to enhance said inhibition.

4,277,360

MANGANESE DIOXIDE

Geoffrey W. Mellors, North Royalton, and Glenn W. Sheffield, Strongsville, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

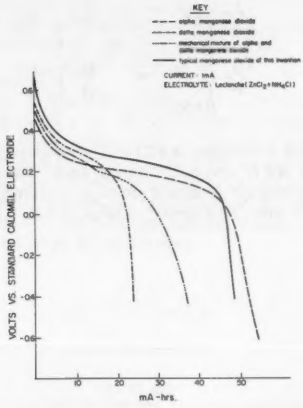
Filed Mar. 28, 1979, Ser. No. 24,596
Int. Cl.[3] H01M 4/88; C01G 45/02
U.S. Cl. 252—182.1 8 Claims

1. A method for producing a manganese dioxide composition for use as a battery cathode depolarizer comprising homogeneous manganese dioxide having domains of alpha and delta manganese dioxide as determined by X-ray diffraction patterns showing, at an intensity of I/I of 10 or more, "d" lines with at least the following values:

about 6.91 to about 7.27,
about 4.90 to about 4.98,
about 2.40 to about 2.46 and
about 1.41 to about 1.43, and

having a combined sodium content of about 0.1 to about 2.0% by weight on a dry basis; and having sufficient electrochemical activity as a battery depolarizer according to the Kozawa and Powers test procedure to exhibit a voltage against a standard calomel electrode of at least +0.2 volt after a 30 milliamperehour discharge comprising the steps of:

(a) reacting a sodium containing composition selected from the group consisting of sodium hydroxide, sodium carbonate, sodium oxide and mixtures thereof with a manganese-oxygen containing composition of a temperature in the range of from about 200° C. to about 600° C., in the mole ratio of sodium to manganese in the range of from about 0.3:1.0 to about 4.0:1.0; and



(b) treating the reaction product with an aqueous acid in a concentration and amount sufficient to decrease the sodium content of the final manganese dioxide composition to an amount in the range of from about 0.1 to about 2.0% by weight on a dry basis.

7. A manganese dioxide composition for use as a battery cathode depolarizer comprising homogeneous manganese dioxide having domains of alpha and delta manganese dioxide as determined by X-ray diffraction patterns showing, at an intensity of I/I. of 10 or more, "d" lines with at least the following values:

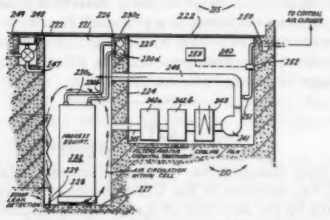
about 6.91 to about 7.27,
about 4.90 to about 4.98,
about 2.40 to about 2.46 and
about 1.41 to about 1.43, and

having a combined sodium content of about 0.1 to about 2.0% by weight on a dry basis; and having sufficient electrochemical activity as a battery depolarizer according to the Kozawa and Powers test procedure to exhibit a voltage against a standard calomel electrode of at least +0.2 volt after a 30 milliamperehour discharge.

4,277,361
VENTILATING SYSTEM FOR REPROCESSING OF NUCLEAR FUEL RODS

Milton J. Szulinski, Richland, Wash., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 4, 1977, Ser. No. 793,659
Int. Cl.[2] G21F 7/06; G21C 19/42
U.S. Cl. 422—120 **5 Claims**



1. In a reprocessing plant for depleted fuel rods, the combination of:

a plurality of quasi-hermetically sealed compartments in which appropriate steps of the reprocessing are conducted;

an air processing facility for each said quasi-hermetically sealed compartment;

at least one means for introducing air into the combination of said quasi-hermetically sealed compartment and its air processing facility;

an exhaust manifold system for withdrawing stale air from each of a plurality of said quasi-hermetically sealed compartments and directing such stale air to a central air cleaner;

a central air cleaner for the stale air collected by said exhaust manifold system;

turnover rate control means for each said quasi-hermetically sealed compartment maintaining the air inventory turnover rate in said combination of quasi-hermetically sealed compartment and its air processing facility at one turnover in a time interval greater than one day but less than one year, such turnover rate defining the quasi-hermetic sealing of the compartment; and

filtering means and cooling means in each said air processing facility adapted uniquely to deal with the air characteristics recirculated to its corresponding quasi-hermetically sealed compartment.

4,277,362
METHOD OF TREATING RADIOACTIVELY CONTAMINATED SOLVENT WASTE

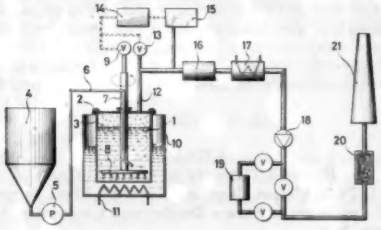
Heinz Mallek; Werner Jablonski, both of Linnich-Tetz, and Willi Plum, Stolberg, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Jun. 27, 1978, Ser. No. 919,739
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729325
Int. Cl.[3] G21F 9/08, 9/14
U.S. Cl. 252—301.1 W **7 Claims**

1. A method of treating radioactively contaminated solvent waste including foreign substances and solvent portions which are volatile, which includes the steps of:

supplying said solvent waste to a first absorbent material which effects dispersion of the solvent and absorption of the foreign substances found in said solvent waste;

passing a gas selected from the group consisting of air and inert gas through said first absorbent material to pick up solvent portions which are volatile as a consequence of their vapor pressure so as to form a gas mixture; and

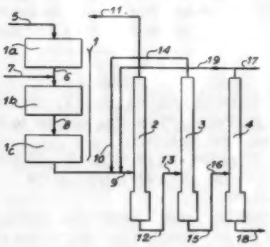


purifying said gas mixture by combustion of said solvent portions.

4,277,363
METHOD FOR PROCESSING A MIXTURE OF AIR AND RARE GASES, ESPECIALLY XENON AND KRYPTON

Jacques Duhayon, Gif-sur-Yvette; Jean-Pierre Goumondy, Vitry; Alain Leudet, Massy, and Jean-Claude Rousseau, Mainvilliers, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 13, 1979, Ser. No. 66,103
Claims priority, application France, Aug. 11, 1978, 78 23735
Int. Cl.[3] G21F 9/02
U.S. Cl. 252—301.1 W **8 Claims**



1. A method for processing a mixture of air and rare gases, at least some portion of which is radioactive, as gaseous effluents arising from the reprocessing of irradiated fuels, wherein said method comprises concentrating the rare gases in solution in liquid argon, as a liquefied mixture, by cryogenic distillation of light gases, a major portion of which is nitrogen, from the liquefied mixture.

4,277,364
ENCAPSULATION BY ENTRAPMENT

Baruch S. Shasha, Peoria; William M. Doane, Morton, and Charles R. Russell, Peoria, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 642,836, Dec. 22, 1975, abandoned. This application Oct. 19, 1976, Ser. No. 733,968
Int. Cl.[3] B01J 13/02; A01N 25/26
U.S. Cl. 252—316 **30 Claims**

1. A method of encapsulating a chemical biological agent comprising the steps of:

a. preparing a dispersion or solution of a suitable chemical biological agent in a first matrix-forming material comprising an aqueous solution of a polyhydroxy polymer xanthate (PPX) having a xanthate degree of substitution (D.S.) of from about 0.1 to 3, wherein said solution has a concentration of PPX of from about 5–70%, and wherein the relative amount of said PPX with respect to said biological agent is sufficient to entrap said agent within a matrix of said PPX;

b. reacting from a single phase said PPX with a coupling agent selected from the group consisting of sodium nitrite, nitrous acid, iodine, chlorine, sodium tetrathionate, cyanogen bromide, nitrosyl chloride, chloramine T, hydrogen peroxides, and water-soluble salts of polyvalent metal ions at a pH of from about 2 to about 7 to form a first insolubilized matrix thereby entrapping said agent; and

c. recovering said entrapped chemical biological agent.

23. A composition of matter produced by the process of claim 1.

4,277,365

PRODUCTION OF REDUCING GAS

Peter L. Paull, Weston, Conn., and Edward T. Child, Tarrytown, N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

Continuation of Ser. No. 950,636, Oct. 12, 1978, abandoned. This application Dec. 17, 1979, Ser. No. 104,325

Int. Cl.[3] C01B *3/34;* C10J *3/46*

U.S. Cl. 252—373 8 Claims

1. A process for the production of a reducing gas which comprises subjecting a carbonaceous feed consisting essentially of a mixture of a low grade hydrocarbon oil and 30–70 weight percent of a high ash solid fuel containing at least 30 weight percent ash in the presence of H_2O in an amount not greater than 0.19 pound per pound of gasifiable material in the feed to partial oxidation with an oxygen containing gas in the presence of a fluxing agent added in an amount between about 1 and 10 weight percent based on the feed at a temperature between about 2000° and 2800° F. using an O:C atomic ratio of less than 1.2 to produce a reducing gas having a reducing ratio of at least 10 and having a free carbon content of less than 2.0 percent based on the carbon content of the feed.

4,277,366

POLY(ALKYLENE OXIDE) COMPOSITION

Blake F. Mago, Pocono Pines, Pa., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 26, 1979, Ser. No. 79,202

Int. Cl.[3] C23F *11/12, 11/14*

U.S. Cl. 252—392 10 Claims

1. A poly(alkylene oxide) composition having incorporated therein an effective amount of a mononuclear aromatic compound having at least one substituent nitro group.

4,277,367

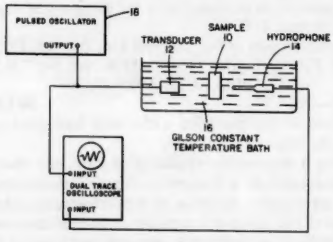
PHANTOM MATERIAL AND METHOD

Ernest L. Madsen; James A. Zagzebski; Richard A. Banjavic, and Michele M. Burlew, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 23, 1978, Ser. No. 953,761

Int. Cl.[3] C09K *3/00;* G01N *31/00, 33/00;* A61B *10/00*

U.S. Cl. 252—408 26 Claims



1. Tissue mimicking material comprised of a scatterer in finely divided form uniformly dispersed throughout a congealed gel matrix, having in the absence of particulate scatterers a speed of sound within the range of 1400–1650 m/s, and formed of a gel forming material, water and an organic hydroxy compound soluble in the water, with or without a preservative.

25. Tissue mimicking material comprised of a scatterer in finely divided form uniformly dispersed throughout a congealed gel matrix, having in the absence of particulate scatterers a speed of sound within the range of 1400–1650 m/s, and formed of a gel forming material, water and an organic hydroxy compound soluble in the water, with or without a preservative, in which the gel forming material is gelatin, in which the hydroxy compound is n-propanol present in an amount within the range of 5–25% by volume of the gel, and in which the scatterer is graphite present in the gel in an amount within the range of 0.01–0.2 gm/cm^3.

4,277,368

SULFUR DIOXIDE DETECTOR

J. A. Amy, Bloomington, Ind., and Harvard C. Huber, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1980, Ser. No. 129,061

Int. Cl.[3] G01N *21/06, 21/12;* C09K *3/00*

U.S. Cl. 252—408 4 Claims

1. A method of preparing a composition for use in detecting the presence of sulfur dioxide comprising,

first soaking activated silica gel in an aqueous solution of potassium permanganate,

then drying said soaked silica gel,

then dissolving silicone rubber in n-hexane,

then mixing said dried soaked silica gel and silicone rubber solution in a ratio of about 1 part dried soaked silica gel to between about 2 and 3 parts of silicone rubber, and

then solidifying said mixture by curing at room temperature after solvent is removed by evaporation.

4,277,369

REGENERATION OF A CATALYST FOR AROMATIC HYDROCARBONS STEAM DEALKYLATION

Philippe Courty, Houilles; Jean Miquel, Paris; Germain Martino, Poissy, and Alain Convers, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 29, 1979, Ser. No. 98,453

Claims priority, application France, Nov. 29, 1978, 78 33910

Int. Cl.[3] B01J *21/20, 23/96;* C07C *4/18*

U.S. Cl. 252—415 16 Claims

1. In a continuous process for steam dealkylation of aromatic hydrocarbons in the presence of a catalyst comprising a carrier and, by weight, from 0.1 to 1% of at least one noble metal of the platinum family, from 0.5 to 4% of halogen, a second metal or metal compound wherein the metal is selected from titanium, rhenium, copper, silver and gold, and a third metal or metal compound wherein the metal is selected from lithium, sodium, potassium, rubidium and cesium,

the improvement wherein said process is effected in at least two reaction zones, each of said zones being alternatively disconnected for regeneration of the catalyst contained therein and then reconnected to the reaction system; wherein said regeneration is effected by a process comprising the steps of:

(a) passing through the disconnected reaction zone and the catalyst contained therein a hydrogen stream at a space velocity of from 1 to 10,000 volumes per volume of catalyst per hour, a pressure of from about 1 to 25 bars and a temperature of from about 300° to 700° C.;

(b) scavenging the hydrogen-washed catalyst with an inert gas stream to remove any residual hydrogen;

(c) progressively replacing the inert gas with a gas containing molecular oxygen;

(d) burning off coke deposited on the catalyst contained in the disconnected reaction zone by passing therethrough a gas containing molecular oxygen at an oxygen partial

pressure of at least 0.005 bar and further containing from 0.01 to 10% by volume of steam, said gas being introduced into the disconnected reaction zone at a temperature between about 300° and 550° C., a pressure of from about 1 to 25 bars and a space velocity of from 1 to 500 volume per catalyst volume per hour, the oxygen content of the gas being so adjusted as to limit the temperature of the combustion front passing through the catalyst to a maximum of 650° C., the difference between the temperature of said front and the temperature of the gas supplied at the inlet of the catalyst bed being not greater than 150° C., calcination being continued, after the combustion front has passed through the catalyst bed, at a temperature of from about 300°-500° C. for a time sufficient to reduce the initial carbon content of the catalyst at the time of disconnecting the reaction zone by at least 90%;

(e) reactivating the catalyst by passing therethrough a stream of air or an equivalent gas containing at least one halogen or halogenated compound, at a space velocity of from about 1 to 10,000 volumes per volume of catalyst per hour, a temperature of from about 300° to 500° C., and a pressure of from about 1 to 25 bars, for a time sufficient to bring the halogen content of the catalyst to a value between 0.5 and 4% by weight;

(f) calcining the reactivated catalyst by-passing therethrough a stream of air or an equivalent gas, at a temperature of from about 300° to 600° C. a space velocity of from about 1 to 10,000 volumes per volume of catalyst per hour and a pressure of from about 1 to 25 bars; and

(g) purging the disconnected reaction zone by passing therethrough an inert gas stream.

4. A process according to claim 1, wherein, during step (a), the hydrogen stream contains a halogen or a halogen compound in an amount such that, at the end of step (a), the catalyst contains, by weight, about 0.5 to 4% of halogen.

9. A process according to claim 1, wherein, after the purge of step (g), the catalyst, before being reused as dealkylation catalyst, is subjected to reduction by means of a hydrogen containing gas.

4,277,370

ALPHA-OLEFIN POLYMERIZATION CATALYST

Nicholas M. Karayannis, Naperville, and John S. Skryantz, Lisle, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 14,891, Feb. 15, 1979, abandoned. This application Jan. 21, 1980, Ser. No. 113,543

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **79 Claims**

1. A catalyst for the polymerization of alpha-olefins of at least 3 carbon atoms comprising (A) an organoaluminum component, and (B) a solid component which is the reaction product of components comprising

(1) at least one titanium(IV) halide or haloalcoholate;

(2) at least one organic electron donor containing at least one of oxygen, nitrogen, sulfur and phosphorus; and

(3) at least one hydrocarbon-insoluble, magnesium-containing pretreatment product of components comprising

(a) at least one magnesium alcoholate; and

(b) at least one Group II or IIIA metal alkyl;

wherein the atomic ratio of metal in (3)(b) to metal in (3)(a) ranges from about 0.001:1 to about 1:1, the atomic ratio of titanium in (1) to metal in (3)(a) is at least about 0.5:1, and (2) is employed in an amount ranging from about 0.001 to about 1 mole per gram-atom of titanium contained in (1).

4,277,371

CATALYST-FORMING COMPONENTS, PROCESS FOR PREPARING SAME, AND CATALYSTS FOR STEREOSPECIFICALLY POLYMERIZING OLEFINS PREPARED THEREFROM

Cornelio Caldo, and Luigi Basili, both of Terni, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 29, 1979, Ser. No. 43,038

Claims priority, application Italy, May 29, 1978, 23925 A/78; Nov. 13, 1978, 29708 A/78

Int. Cl.³ C08F *4/02, 4/64*

U.S. Cl. 252—429 B **11 Claims**

1. Process for preparing a solid catalyst-forming component based on titanium trichloride, useful in the stereo-specific polymerization of olefins, characterized in that the catalyst component is obtained by:

(a) dispersing a siliceous material of the diatomite type having a silica content higher than 50% by weight in a mixture of an inert hydrocarbon solvent and $TiCl_4$, in an amount of from 2 to 100 g/gram mole of $TiCl_4$;

(b) reducing $TiCl_4$, in the presence of said siliceous material, to $TiCl_3$ by means of aluminum-organic compounds, at temperatures ranging from −20° C. to +20° C.; and

(c) washing with the hydrocarbon solvent, filtering, and drying the solid catalyst-forming component so obtained.

4,277,372

SOLID CATALYST COMPONENT FOR OLEFIN POLYMERIZATION

Albert S. Matlack, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 9, 1980, Ser. No. 110,563

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **9 Claims**

1. A process for the preparation of a solid catalyst component for use in the polymerization of 1-olefins, which component is composed of a titanium halide deposited on an essentially anhydrous magnesium halide support, said process comprising the steps, carried out in an inert atmosphere, of (1) contacting a hydrocarbon solution of a magnesium salt of an aliphatic carboxylic acid containing at least six carbon atoms with a hydrocarbon solution of a C_2–C_{20} alkylaluminum dichloride, the amount of said dichloride relative to said salt being sufficient to provide a mole ratio of Al:Mg of at least 2:1, said solutions being contacted with each other at a temperature of from about 10° C. to about 100° C., thereby forming a hydrocarbon suspension of magnesium chloride particles, (2) isolating said particles from said suspension, (3) successively washing said particles with a hydrocarbon solvent until the particles are substantially free of chloride and unadsorbed aluminum compounds, (4) contacting the washed particles with an electron donor, (5) washing the donor-treated particles with a hydrocarbon solvent, and (6) contacting the washed particles with a titanium halide, thereby effecting deposition of said titanium halide on the magnesium chloride particles, said hydrocarbon solvent being any liquid hydrocarbon or mixtures thereof, and said electron donor being selected from the group consisting of C_4–C_{24} aliphatic ethers, C_3–C_4 cyclic ethers, C_7–C_{15} aromatic ethers, C_4–C_{24} alkyl esters of fatty acids, C_8–C_{24} alkyl esters of aromatic acids, C_1–C_{12} aliphatic amines, C_4–C_6 cyclic amines, C_6–C_{10} aromatic amines, C_1–C_{18} aliphatic alcohols, C_7–C_{15} aromatic alcohols, C_6–C_{10} phenols, C_6–C_{18} aliphatic or aromatic phosphines and C_6–C_{12} aliphatic sulfides.

4,277,373

ALUMINA-ALUMINUM FLUOROPHOSPHATE-CONTAINING CATALYSTS

Willard H. Sawyer, Baton Rouge, and Neville L. Cull, Baker, both of La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 16, 1979, Ser. No. 66,940
Int. Cl.³ B01J *27/14, 29/06*
U.S. Cl. 252—437 8 Claims

1. A catalyst comprising a hydrogenation component selected from the group consisting of Group VIB metal component, Group VIII metal component and mixtures thereof of the Periodic Table of Elements, composited with an ultrastable Y-type crystalline aluminosilicate zeolite having a unit cell size less than 24.5 angstroms, and an alumina-aluminum fluorophosphate, said ultrastable Y-type crystalline aluminosilicate being substantially free of rare earth metals.

4,277,374

FERRITIC STAINLESS STEEL SUBSTRATE FOR CATALYTIC SYSTEM

Remus A. Lula, Natrona Heights, and George Aggen, Sarver, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1980, Ser. No. 115,816
Int. Cl.³ B01J *21/04, 21/06, 21/18, 23/86*
U.S. Cl. 252—446 10 Claims

1. In a system comprising a ferritic stainless steel substrate having a tightly adherent oxide coating and a catalytic material thereupon, said ferritic stainless steel being of a chemistry which forms a tightly adherent non-spalling scale suitable for application of a catalytic bearing material; the improvement comprising a ferritic stainless steel substrate consisting essentially of, by weight, up to 26% chromium, from 1 to 8% aluminum, from 0.02 to 2% hafnium, up to 0.3% yttrium, up to 0.1% carbon, up to 2% silicon, balance essentially iron.

4,277,375

CATALYTIC OXIDE OF MOLYBDENUM, VANADIUM, TANTALUM AND OPTIONAL 4TH METAL

Harry J. Decker, and Erlind M. Thorsteinson, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 505,783, Sep. 13, 1974, which is a continuation-in-part of Ser. No. 408,417, Oct. 23, 1973, abandoned. This application Oct. 11, 1977, Ser. No. 841,055
Int. Cl.³ B01J *23/20, 23/22, 23/28, 23/34*
U.S. Cl. 252—455 R 9 Claims

1. A calcined oxidation catalyst consisting essentially of the elements Mo, V, Ta and X in the form of oxides, in the ratio

$$Mo_aV_bTa_cX_d$$

wherein

X is at least one element selected from the group consisting of Cu, Co, Cr, and Mn

a is 12,

b is 1 to 14,

c is 0.1 to 12, and

d is 0 to 3.0,

said catalyst being devoid of catalytically active forms of tellurium.

4,277,376

PROCESS FOR THE MANUFACTURE OF A MONOLITHIC SUPPORT FOR CATALYSTS SUITABLE FOR USE IN CONTROLLING CARBON MONOXIDE EMISSIONS

Sergio Paolasini, Turin, Italy, assignor to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Jul. 16, 1979, Ser. No. 57,856
Claims priority, application Italy, Jul. 26, 1978, 68778 A/78
Int. Cl.³ B01J *21/12*
U.S. Cl. 252—455 R 22 Claims

1. A process for the manufacture of a monolithic support for a catalyst suitable for use in controlling carbon monoxide emissions, characterized by forming a homogeneous, fluid semi-solid mass by admixing a solid mixture comprising colloidal γ alumina having a grain size not exceeding 1 micron, α alumina monohydrate and ceramic fibres with one or more fluidising and binding agents for said mixture, water and a mineral acid, said αAl_2O_3 monohydrate being used in an amount of from 40 to 60% by weight with respect to the total weight of the α and γ aluminas and said acid being used in an amount sufficient to convert said αAl_2O_3 monohydrate into a gel, forming said mass into a body of the desired shape and provided with continuous channels, drying said body to substantially remove the added water, at least 10% of said added water being gradually removed at a temperature lower than 50° C., and heat-treating the dried body at a temperature of from 800° to 1000° C. to impart strength and porosity to the body.

7. The process of claim 1, wherein said fibres are aluminosilicate fibres.

9. The process of claim 1, wherein said fluidising and binding agents are selected from the group consisting of carboxymethyl cellulose, methyl cellulose, polyvinyl alcohol, glycols and alginates.

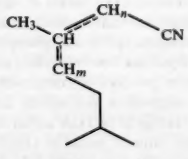
4,277,377

PERFUME COMPOSITIONS CONTAINING DIMETHYL HEPTENONITRILES

David Webb, Brentwood, and Anthony J. Mills, London, both of England, assignors to Bush Boake Allen Limited, London, England

Filed Mar. 19, 1980, Ser. No. 131,632
Claims priority, application United Kingdom, Mar. 22, 1979, 10195/79
Int. Cl.³ C07B *120/00;* A61K *7/46*
U.S. Cl. 252—522 R 5 Claims

1. A compounded perfumery composition which comprises a plurality of odiferous chemicals together with at least one compound having the formula I.



wherein n and m are integers having a value of 1 or 2, m+n=3 and the dashed line indicates alternative positions for a single unit of unsaturation.

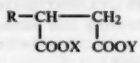
4,277,378

DETERGENT COMPOSITIONS CONTAINING PARTIALLY NEUTRALIZED ALKYL OR ALKENYL SUCCINIC ACID

Kaoru Tsujii, Utsunomiya; Naoyuki Saito, and Michio Kawai, both of Ichikaimachi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,621
Claims priority, application Japan, Apr. 20, 1979, 54-48835
Int. Cl.³ C11D 1/04
U.S. Cl. 252—546 7 Claims

1. A detergent composition containing from 3 to 95 wt. % of partially neutralized succinic acid derivative having the formula



(1)

wherein R is a saturated or unsaturated hydrocarbon group having from 8 to 18 carbon atoms, and X and Y are each hydrogen, an alkali metal, ammonium or an alkanolamine, with the proviso that from 0.2 to 0.9 equivalents of the groups COOX and COOY are alkali metal, ammonium or alkanolamine carboxylate groups and the remainder are carboxyl groups;

the balance of said detergent composition being conventional ingredients of liquid or granular detergents, said ingredients being different from said derivative, with the provisos that said detergent composition is free of alkaline builder and an aqueous solution of said detergent composition containing 0.5 wt. % of said derivative has a pH of 5.5 to 8.0.

4,277,379

FLAME RESISTING COMPOSITION

Gerson Hermann, Westfield; Babubhai C. Patel, and Sudhakerbhai B. Patel, both of Edison, all of N.J., assignors to Apex Chemical Company, Inc., Elizabethport, N.J.

Filed Nov. 23, 1979, Ser. No. 96,673
Int. Cl.³ C09K 3/28
U.S. Cl. 252—608 20 Claims

1. A composition of matter comprising an aqueous paste of a substantially monobasic tetrachloro or tetrabromophthalate salt in finely divided form as the dispersed phase and sufficient quantities of a dispersing agent and a thickener to prevent agglomeration and settling of the dispersed phase.

4,277,380

WATER-DISPERSIBLE URETHANE POLYMERS AND AQUEOUS POLYMER DISPERSIONS

Roy C. Williams, East Amherst, and David R. Rogemoser, Tonawanda, both of N.Y., assignors to Textron, Inc., Providence, R.I.

Filed Mar. 29, 1979, Ser. No. 25,050
Int. Cl.³ C08L 91/00; C08G 18/00
U.S. Cl. 260—18 TN 27 Claims

1. A carboxylic group-containing, oil-modified, urethane polymer composition comprising the reaction product of ethylenically-unsaturated fatty acid ester polyol of drying or semi-drying fatty acid having up to about 22 carbon atoms, and isocyanate-terminated, urethane prepolymer of hydrocarbon diisocyanate and dihydroxy alkanoic acid.

14. A stable, aqueous dispersion of an organic solvent solution of an oil-modified urethane polymer, said urethane polymer being an ammonia or amine salt of a carboxylic group-containing, oil-modified urethane polymer composition comprising the reaction product of ethylenically-unsaturated fatty acid ester polyol of drying or semi-drying fatty acid having up to about 22 carbon atoms, and isocyanate-terminated, urethane prepolymer of hydrocarbon diisocyanate and dihydroxy alkanoic acid.

4,277,381

PROCESS FOR THE FORMATION OF ELASTOMERIC BLENDS OF A SULFONATED ELASTOMERIC POLYMER

Jan Bock, Bridgewater; Henry S. Makowski, Scotch Plains, and Robert D. Lundberg, Bridgewater, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 855,726, Nov. 29, 1977, abandoned. This application Mar. 23, 1979, Ser. No. 22,977
Int. Cl.³ C08L 91/00
U.S. Cl. 260—23.5 A 25 Claims

1. An elastomeric blend composition consisting of:

(a) a neutralized sulfonated EPDM terpolymer having about 15 to about 50 meq. of neutralized sulfonate groups per 100 grams of said terpolymer, said neutralized groups having a metal or ammonium counterion, said neutralized sulfonated EPDM terpolymer being formed from an EPDM terpolymer having a Mooney viscosity (M.L. 1+8, 212° F.) of about 10 to about 50; and

(b) about 25 to about 150 parts by weight of a non-polar process oil per 100 parts of said neutralized sulfonated EPDM terpolymer, said non-polar process oil having less than 2 wt. % polar-type compounds and about 12.0 to less than 59.3 wt. % aromatic constituents.

4,277,382

STABLE AQUEOUS EMULSION OF REACTIVE POLYSILOXANE AND CURING AGENT

Kingso C. Lin, and Donald J. Hammond, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 9, 1979, Ser. No. 83,019
Int. Cl.³ C08L 83/06
U.S. Cl. 260—29.2 M 12 Claims

1. A method of producing a gelation resistant aqueous emulsion suitable for coating glass fibers and comprising a polysiloxane resin having at least two functional groups selected from silanol groups and groups readily hydrolyzable thereto, a non-resinous silane reactable with at least two of said functional groups for curing said polysiloxane resin and a catalyst, said method comprising:

(a) dispersing said polysiloxane resin, and optionally said silane, in a first aqueous medium with a nonionic or anionic first surfactant to form a polysiloxane resin emulsion;

(b) dispersing said catalyst, and optionally said silane, in a second aqueous medium with a second surfactant comprising a polycarbinolpolysiloxane substantially free of silanol groups or groups readily hydrolyzable to silanol groups, to form a catalyst emulsion; and

(c) mixing said polysiloxane resin emulsion and said catalyst emulsion together; where said silane is included in at least one of steps (a) and (b).

4,277,383

AQUEOUS CATIONIC THERMOSETTING URETHANE RESIN COATING COMPOSITIONS

Masaaki Hayashi, Tokyo; Koichi Nagami, Musashino; Kazuyoshi Tsuneta, Yokohama, and Nobuhiro Kenmotusu, Fujisawa, all of Japan, assignors to Dai Nippon Toryo Co., Ltd, Osaka, Japan

Filed Feb. 11, 1980, Ser. No. 120,050
Claims priority, application Japan, Feb. 15, 1979, 54-16441; Mar. 9, 1979, 54-27470
Int. Cl.³ C08L 61/10, 75/12
U.S. Cl. 260—29.3 7 Claims

1. An aqueous thermosetting resin coating composition comprising (A) a cationic thermosetting urethane resin, (B) a water-insoluble resol type phenolic resin, (C) an acid as a neutralizing agent and (D) water as a diluent, wherein the cationic thermosetting urethane resin (A) is a thermosetting resin formed by reaction between hydroxyl groups in a reaction product of a polyurethane prepolymer having a terminal

isocyanate group with a tertiary amine having at least 2 hydroxyl groups in the molecule and isocyanate groups in a reaction product of equimolar amounts of an organic diisocyanate and a monofunctional blocking agent, the water-insoluble resol type phenolic resin (B) is a thermosetting resin formed by reacting an aldehyde with a phenol at an aldehyde/phenol molar ratio of from 1.0 to 2.5 in the presence of an alkaline catalyst and the mixing weight ratio (based on the solids) of the cationic thermosetting urethane resin (A) to the water-insoluble resol type phenolic resin (B) is in the range of from 99/1 to 70.30.

4,277,384

HETEROPOLYMER ACRYLIC LATICES AND TEXTILES TREATED THEREWITH

Charles T. Arkens, Hatfield, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 25, 1978, Ser. No. 945,733
Int. Cl.[3] C08L *33/08*
U.S. Cl. 260—29.6 RB **4 Claims**

1. As a textile treating composition, an acrylic latex, the particles of which comprise about 30–60% by weight of polymeric core and about 70–40% by weight of a polymeric shell, wherein said core is formed by emulsion polymerization of a first monomer composition consisting essentially of:

70–95% by weight of a C_1–C_8 alkyl acrylate,
0–15% by weight of a C_1–C_8 alkyl methacrylate,
4–10% by weight of acrylamide or methacrylamide,
0–0.3% by weight of allyl methacrylate, and
0–2% by weight of itaconic acid;

and wherein said shell is formed on said core by emulsion polymerization of a second monomer composition in the presence of said core, said second monomer composition consisting essentially of:

40–70% by weight of a C_1–C_8 alkyl acrylate,
20–50% by weight of a C_1–C_8 alkyl methacrylate,
2–10% by weight of N-methylolacrylamide,
N-methylol methacrylamide, or a mixture of methacrylamide and
N-methylolacrylamide, and
0–2% by weight of itaconic acid.

4,277,385

HIGH PVC LATEX PAINT

Howard E. Carroll, Grafton, and Gerald M. Sweitzer, North Ridgeville, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 10,631, Feb. 9, 1979, abandoned. This application May 1, 1980, Ser. No. 145,612
Int. Cl.[3] C08L *33/02*
U.S. Cl. 260—29.6 RW **4 Claims**

1. An aqueous latex dispersion paint composition which coalesces at an ambient coalescent temperature into a hardened paint film, said latex paint having about 30% to 70% by weight total solids, the improvement comprising on a dry solids volumn basis:

15% to 25% of a film-forming acrylic latex binder having an average polymer particle size between about 0.1 and 0.5 microns and a glass transition temperature at least about 5° C. below said coalescent temperature whereby said binder particles will coalesce into a binding matrix, said binder being an acrylic copolymer derived from copolymerization of at least 90% acrylic monomer and the remaining being ethylenically unsaturated monomers on a weight basis;

72% to 77% of solid, non-cellular, non-film-forming polymer particles having an average particle size diameter of between about 0.2 and 0.8 micron and having a glass transition temperature at least about 30° C. above the glass transition temperature of said acrylic binder, said non-film-forming particles being polymerized ethylenically unsaturated monomers having carbon-to-carbon unsaturation copolymerized with 0.2 to 2% by weight unsaturated acid selected from acrylic or methacrylic acid;

3% to 8% opacified pigment having refractive index of at least about 1.8;

said latex paint substantially free of inorganic non-opacifying pigment; and said latex paint having a pigment-volume-content (PVC) greater than 75% and less than 85% PVC.

4,277,386

ADHESIVE COMPOSITION

Michael E. Swanson, Granville, and Sanford K. Lauderback, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 79,398, Sep. 27, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 179,333
Int. Cl.[3] C08K *3/28*
U.S. Cl. 260—29.6 RW **8 Claims**

1. An adhesive composition comprising a carboxylated vinyl acetate-ethylene latex, a non-carboxylated vinyl acetate-ethylene latex and ammonium dichromate.

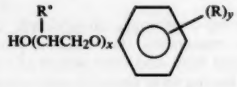
4,277,387

PLASTICIZER COMBINATION OF ALKYLENE OXIDE-ALKYL PHENOL ADDUCT AND CARBOXYLIC ACID ESTER, AND CAULKING COMPOSITION

Arthur D. Jordan, Jr., Philadelphia, and Joseph A. Lavelle, Bethlehem, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 88,200, Oct. 23, 1979, abandoned, which is a division of Ser. No. 917,436, Jun. 20, 1978, abandoned. This application May 27, 1980, Ser. No. 153,350
Int. Cl.[3] C08K *5/09, 5/10*; C09J *3/14*
U.S. Cl. 260—29.7H **17 Claims**

1. In a putty-like mastic, caulking, or sealant composition containing a binder consisting essentially of an elastomer in the form of a synthetic polymer and a water insoluble plasticizer, in the weight ratios of plasticizer:binder of from about 0.01:1 to about 5:1, and optionally containing one or more additives in the form of an emulsifier, a dispersant, an organic solvent, a base, a pigment, a filler, a dye, a defoamer, a thickener and an adhesion promoter, and the like, the improvement in which the plasticizer is a combination of (1) a water-immiscible adduct of ethylene oxide or propylene oxide and an alkyl phenol, said adduct having the formula



Formula I

in which
R' is H or CH^3,
x is from 1 to 7,
R is C_1 to C_{12} alkyl, and
y is 1 or 2, and

(2) a water insoluble plasticizer selected from at least one of a polyester of an alcohol and an aliphatic or aromatic carboxylic acid, the ratio of (1) to (2) on a weight basis being from about 10:90 to about 90:10, and in which the caulk consistency is between 5 seconds and 100 seconds.

4,277,388
THERMOPLASTIC RESIN OF HYDROLYZED PRODUCT OF VINYL CHLORIDE COPOLYMER FOR USE IN COATING RESIN AND PROCESS FOR PREPARING SUCH RESIN

Toshio Kagami; Yoshijiro Saito; Shigeru Matsushita, and Kunio Iriuchijima, all of Shibukawa, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 24,764, Mar. 28, 1979, abandoned. This application Sep. 28, 1979, Ser. No. 79,862
Int. Cl.³ C08F *8/12*
U.S. Cl. 260—33.4 R **11 Claims**

1. A process for preparing a thermoplastic resin for use in a coating resin to be coated on a base film of a magnetic recording tape which comprises the steps of:

(a) copolymerizing 50 to 80% by weight of a vinyl chloride monomer, 20 to 40% by weight of a vinyl ester monomer and 0 to 15% by weight of a comonomer polymerizable with the vinyl chloride monomer to obtain a vinyl chloride copolymer having an average polymerization degree of 200 to 800;

(b) hydrolyzing said vinyl chloride copolymer dissolved in a solvent in the presence of an alcohol until the absorption ratio of OH/CH of the hydrolyzed product in the infrared absorption spectrum reaches 0.5 to 0.9;

(c) decoloring the hydrolyzed product;

(d) cooling and neutralizing with an organic oxide the solution containing the hydrolyzed product of said vinyl chloride copolymer, said organic oxide being selected from the group consisting of propylene oxide and butylene oxide; and

(e) removing the alcohol by distillation at a temperature of 40° C. to 70° C. under a reduced pressure of 50 to 200 Torr until the content of said alcohol in the solution reaches less than 1% by weight,

whereby to obtain the hydrolyzed product in the form of a solution.

4,277,389
X RAY SCATTERING DEVICE

Howard A. Scheetz, Lancaster, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Nov. 5, 1979, Ser. No. 90,884
Int. Cl.³ C08L *77/00*
U.S. Cl. 260—37 N **4 Claims**

1. A method for the preparation of an X-ray scattering device comprising the steps of intimately blending at least 50 weight percent of finely divided barium titanate having a particle size less than about 44 microns with submicron nylon particles prepared by a dissolution and precipitation process and melting the mixture under intensive mixing to wet out and disperse the barium titanate particles in the molten nylon, and forming a shaped article.

4,277,390
POLYMERIC COMPOSITION

Aladdin M. O. Kuliev, ulitsa B. Sardarova, 8, kv. 21; Tokhrul A. O. Kadyrov, prospekt Lenina, 11, kv. 7; Gjuloglan G. O. Gaibov, Zykhskoe shosse, 30, kv. 11, all of Baku; Anatoly G. Sinaisky, ulitsa Plekhanova, 41, kv.20, and Valentina N. Matiyasevich, ulitsa Krasnoputilovskaya, 59, kv.27, both of Leningrad, all of U.S.S.R.

Filed Feb. 12, 1980, Ser. No. 120,848
Claims priority, application U.S.S.R., Feb. 12, 1979, 2723462
Int. Cl.³ C08L *63/02*
U.S. Cl. 260—37 EP **9 Claims**

1. A polymeric composition comprising the following components, in parts by mass:

(polypropylene glycol)diurethanediepoxide	100
diglycidyl ether of bisphenol A	10 to 150
curing agent which is a mixture of m-phenylenediamine and aniline taken in the weight ratio of 0.9–1 to 1	13 to 40

4,277,391
DURABLE POLYESTER MOLDING COMPOSITION AND PRODUCT

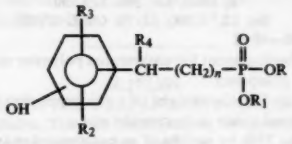
John J. Charles, Bloomingdale, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 27, 1979, Ser. No. 107,796
Int. Cl.³ C08L *67/02*; C08K *5/13, 5/18, 5/53*
U.S. Cl. 260—40 R **14 Claims**

1. Polyester molding composition comprising:

(a) at least about 40 wt% poly (C_2–C_4 alkylene terepthalate) based on total composition;

(b) between about 0.1 and about 5 wt% based on poly (C_2–C_4 alkylene terephthalate) of phosphonate of the formula:

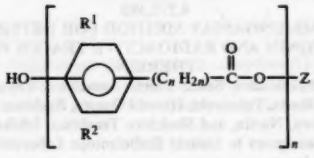


wherein n is 0 or 1 and:

(i) when n is 1, each of R and R_1 is alkyl, having from 12 to 24 carbon atoms and R_2 and R_3 each independently represents alkyl having from 1 to 18 carbon atoms; and

(ii) when n is^o, R_2, OH and R_3 are fixed, respectively, in the 3, 4 and 5 positions of the benzene ring portion of the benzyl phosphonate, each of R and R_1 is higher alkyl of from 14 to 30 carbon atoms, R_2 is alkyl of 1 to 6 carbon atoms, R_3 is tertiary butyl and R_4 is hydrogen or methyl;

(c) between about 0.1 and about 5 wt% based on poly (C_2–C_4 alkylene terephthalate) of compound of the formula:



wherein:

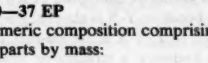
R^1 is methyl, ethyl or an α-branched alkyl group of from 3 to 10 carbon atoms;

R^2 is hydrogen, methyl, ethyl or an α-branched alkyl group of from 3 to 10 carbon atoms;

x has a value of from 1 to 6;

n has a value of from 2 to 6; and

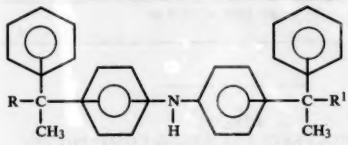
Z is an aliphatic hydrocarbon of the formula:



in which y has a value of from 2 to 18 when n is 2 and a value of from 3 to 6 when n is greater than 2, the value of y in all cases being equal to or greater than that of n; an d

(d) between about 0.1 and about 5 wt% based on poly (C_2–C_4 alkylene terepthalate) of diphenylamine derivative of the general formula:

Formula III



where R and R^1 are methyl or phenyl.

4,277,392

THICKENING AGENTS FOR UNSATURATED POLYESTER RESIN COMPOSITIONS

Martin L. Feldman, East Brunswick, and James T. De Groff, Oldwick, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 44,725, Jun. 1, 1979. This application Mar. 6, 1980, Ser. No. 129,550

Int. Cl.³ C08G *63/76;* **C08L** *67/00*

U.S. Cl. 260—40 R **6 Claims**

1. A thickening agent for unsaturated polyester resin compositions that comprises

(a) 25% to 70% by weight of a thickener that is a Group II-A metal oxide or hydroxide and

(b) 30% to 75% by weight of an unsaturated polyester vehicle comprising an unsaturated polyester that is the product of the reaction of a dicarboxylic acid component containing 80 to 90 mole % of at least one unsaturated aliphatic dicarboxylic acid having 4 to 8 carbon atoms and 10 to 20 mole % of at least one saturated aromatic dicarboxylic acid with an alcohol component containing 40 to 60 mole % of at least one glycol having 2 to 6 carbon atoms and 40 to 60 mole % of at least one monohydric alcohol having 6 to 12 carbon atoms, in the amount of 0.4 mole to 0.6 mole of the dicarboxylic acid component per mole of the alcohol component.

4,277,393

RADIOIMMUNOASSAY METHOD FOR DETERMINING CALCITONIN AND RADIOACTIVE TRACER FOR USE THEREIN

Shumpei Sakakibara, Suita; Yuichi Kumahara, Toyonaka; Yoshiaki Okada, Takatsuki; Hiroshi Ogawa, Kashiwa; Nobuhiko Nakazawa, Narita, and Shoichiro Tsushima, Ichikawa, all of Japan, assignors to Daiichi Radioisotope Laboratories, Ltd., Tokyo, Japan

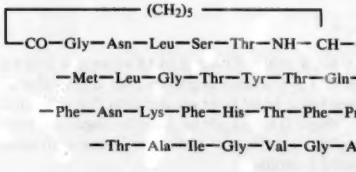
Continuation-in-part of Ser. No. 910,559, May 30, 1978, abandoned. This application Oct. 16, 1978, Ser. No. 951,813

Claims priority, application Japan, Jun. 20, 1977, 52/73130

Int. Cl.³ C07C *103/52;* **G01N** *33/00, 33/48*

U.S. Cl. 260—112.5 R **1 Claim**

1. A radioactive iodine labeled hentriacontapeptide of the formula (I):



(I)

$$\text{(CH}_2\text{)}_5$$

CO—Gly—Asn—Leu—Ser—Thr—NH—CH—CO—

—Met—Leu—Gly—Thr—Tyr—Thr—Gln—Asp—

—Phe—Asn—Lys—Phe—His—Thr—Phe—Pro—Gln—

—Thr—Ala—Ile—Gly—Val—Gly—Ala—Pro—NH_2,

4,277,394

TETRAPEPTIDEHYDRAZIDE DERIVATIVES

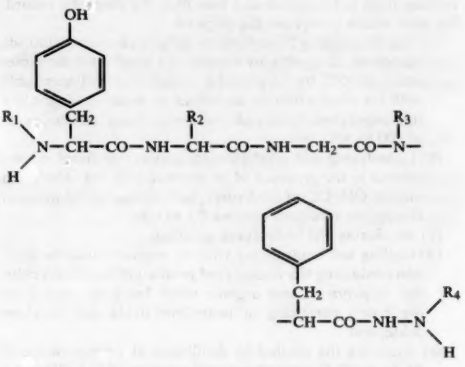
Masahiko Fujino, Hyogo; Susumu Shinagawa, Osaka, and Kiyohisa Kawai, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd, Osaka, Japan

Continuation-in-part of Ser. No. 32,503, Apr. 23, 1979, abandoned. This application Oct. 31, 1979, Ser. No. 90,021

Int. Cl.³ C07C *103/52;* **C07G** *7/00;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **90 Claims**

1. A tetrapeptidehydrazide derivative, inclusive of a pharmacologically acceptable acid addition salt thereof, which has the general formula:



[wherein R_1 is hydrogen or lower alkyl; R_2 is hydrogen or the side chain of a D-α-amino acid; R_3 is hydrogen or lower alkyl; R_4 is hydrogen, or a saturated or unsaturated and straight or branched lower aliphatic acyl group which may optionally be substituted by hydroxyl, amino, lower alkoxy, halogen, oxo, lower thioalkyl or lower thioalkyloxide].

4,277,395

NOVEL ENZYME INHIBITORS

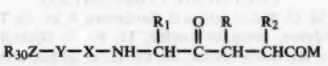
Philippe Bey, Strasbourg, France; Brian W. Metcalf, Mason, and Jeffrey S. Wiseman, Loveland, both of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Jun. 16, 1980, Ser. No. 160,111

Int. Cl.³ C07C *103/52;* **C07D** *207/24*

U.S. Cl. 260—112.5 R **6 Claims**

1. A compound of the formula



$$R_{30}Z\text{—}Y\text{—}X\text{—}NH\text{—}CH\text{—}\overset{\overset{O}{\|}}{C}\text{—}CH\text{—}CHCOM$$

(R_1, R_2)

wherein R is CF_3, CHF_2 or CH_2F; R_1 is a straight or branched lower alkyl group having from 1 to 4 carbon atoms; R_2 is defined the same as R_1 or is benzyl; R_{30} is CHO, carbobenzoxy, tert-butoxycarbonyl, benzoyl or a lower alkanoyl group having from 2 to 5 carbon atoms; X is pro, ala or leu and Y and Z together form a single bond; or Y-X is ala-pro, ala-ala or ala-leu and Z is a single bond; or Z-Y-X is ala-ala-pro, ala-ala-ala or pro-ala-leu; and M is hydroxy, a straight or branched lower alkoxy group having from 1 to 4 carbon atoms, benzyloxy or NY_1Y_2 wherein each of Y_1 and Y_2 is hydrogen or a lower alkyl group having from 1 to 4 carbon atoms and can be the same or different; and pharmaceutically acceptable salts thereof.

4,277,396

THIAZOLEDIAZACYANINE DYESTUFFS

Hans-Lothar Dorsch, Cologne, and Karl H. Hermann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

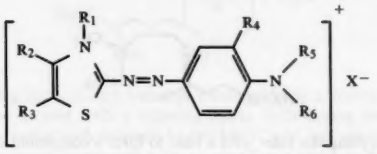
Filed Dec. 21, 1978, Ser. No. 971,719

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758107

Int. Cl.³ C09B *45/00*

U.S. Cl. 260—146 R 3 Claims

1. Dyestuffs of the formula



wherein

R_1 represents a lower alkyl, alkenyl or hydroxylalkyl radical,

R_2, R_3, R_5 and R_6 represent hydrogen or a lower alkyl radical,

R_4 represents a lower alkyl, alkenyl or alkoxy radical and

X^- represents an anion,

4,277,397

MONOAZO COMPOUNDS DERIVING FROM 5-AMINO-BENZIMIDAZOLE-2-ONE-6-CARBOXYLIC ACID

Otto Fuchs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

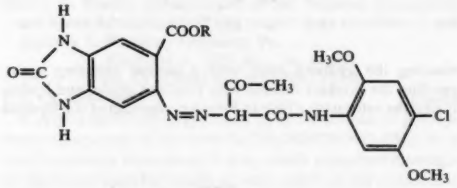
Filed Oct. 29, 1979, Ser. No. 88,851

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1978, 2847284

Int. Cl.³ C09B *29/033, 29/33;* D06P *1/44, 1/46*

U.S. Cl. 260—157 4 Claims

1. A compound of the formula



wherein R is hydrogen, methyl or ethyl.

4,277,398

MAGENTA-MASKED COLOR AZOPYRAZOLINONE COUPLERS

Brian R. D. Whitear, Hutton, England, assignor to Ciba-Geigy AG, Basel, Switzerland

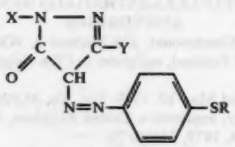
Continuation of Ser. No. 843,628, Oct. 19, 1977, abandoned. This application Aug. 8, 1979, Ser. No. 64,660

Claims priority, application United Kingdom, Nov. 15, 1976, 47423/76

Int. Cl.³ C09B *29/00, 29/46*

U.S. Cl. 260—162 6 Claims

1. An orange-colored magenta color coupler of the pyrazolinone class of the formula



wherein R is alkyl of 1 to 4 carbon atoms, benzyl or phenylethyl optionally substituted by alkyl or alkoxy of 1 to 4 carbon atoms or by halogen, phenyl or phenyl substituted by alkyl of 1 to 4 carbon atoms or halogen, or 2-benzthiazolyl,

X is phenyl or phenyl substituted by halogen, cyano, alkyl, alkoxy, alkylthio, acyl, carboxylic acid-acylamino each up to 5 carbon atoms and sulphonylamino and

Y is a member selected from the group consisting of 2-chloro-5-[2-(4-tert.amylphenoxy)-(2-n-dodecylacetamido)]-anilino, 2-chloro-5-[2-(4-hydroxy-3-tert.butylphenoxy)]-[2-n-dodecylacetamido)]-anilino, 2-chloro-5-[2-(4-hydroxy-3-tert.butylphenoxy]-(2-dodecylacetamido)-anilino and 2-chloro-5-(3-octadecylsuccinimido)-anilino.

4,277,399

PROCESS FOR PREPARING PYRENZEPINE

Eugen Diethelm, Triesen, Liechtenstein, assignor to Grissman Chemicals Limited, London, England

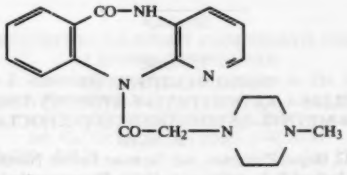
Filed Jun. 6, 1980, Ser. No. 157,099

Claims priority, application United Kingdom, Jul. 9, 1979, 23884/79

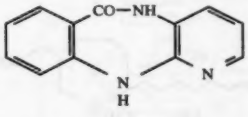
Int. Cl.³ C07D *487/04*

U.S. Cl. 260—239.3 T 5 Claims

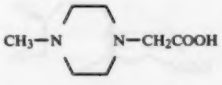
1. A process for the preparation of pyrenzepine having the formula:



or an acid addition salt thereof which comprises (1) reacting a lower alkyl ester of o-aminobenzoic acid with 3-aminopyridine in the presence of a base to produce a tricyclic compound of formula:



and (2) reacting the said tricyclic compound with a mixed anhydride of N-methyl-piperazine acetic acid of the formula:



to produce pyrenzepine which is isolated as such or as an acid addition salt thereof.

4,277,400

2(INDOL-3'-OYL) 3,4,5,6-TETRAHALO BENZOIC ACID ANHYDRIDES

Robert Garner, Greenmount, and Michael J. Whitehead, Failsworth, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

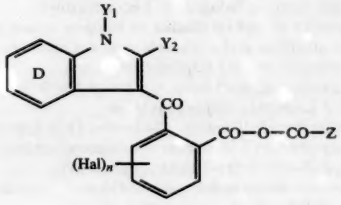
Filed May 10, 1979, Ser. No. 38,024

Claims priority, application United Kingdom, May 18, 1978, 20456/78; Apr. 3, 1979, 11660/79

Int. Cl.³ C07D *209/18*

U.S. Cl. 260—326.13 B **4 Claims**

1. An anhydride compound of the formula



wherein

Hal is fluoro, bromo or chloro,

n is 1 to 4,

Z is alkyl of 1 to 4 carbon atoms, phenyl or phenyl substituted by fluoro, bromo, chloro, methyl, methoxy, ethoxy, alkylamino of 1 to 5 carbon atoms or dialkylamino with 1 to 5 carbon atoms in each alkyl group.

Y_1 is hydrogen, alkyl of 1 to 12 carbon atoms, phenyl or benzyl,

Y_2 is hydrogen, alkyl of 1 to 5 carbon atoms or phenyl,

and the ring D is unsubstituted or substituted by fluoro, bromo, chloro, nitro, alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms.

4,277,401

TOTAL SYNTHESIS OF 1RS,4SR,5RS-4-(4,8-DIMETHYL)-5-HYDROXY-7-NONEN-1-YL)-4-METHYL-3,8-DIOXABICYCLO[3.2.1]OCTANE-1-ACETIC ACID

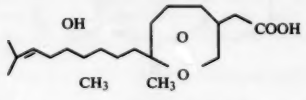
Zoltan G. Hajos, Princeton, and Seymour Levine, North Brunswick, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Aug. 25, 1980, Ser. No. 181,308

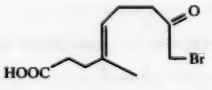
Int. Cl.³ C07D *319/10*

U.S. Cl. 260—340.6 **9 Claims**

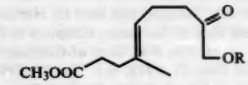
1. The process for the preparation of a compound of the formula



which comprises reacting a compound of the formula



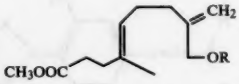
first with potassium acetate and then with diazomethane to form a compound of the formula



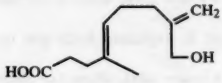
reacting the ketone with a compound of the formula

$(C_6H_5)_3P{=}CH_2$

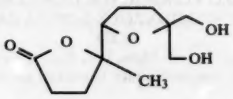
to form a compound of the formula



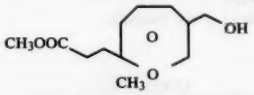
hydrolyzing the ester with a base to form a compound of the formula



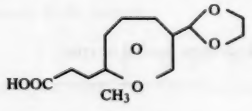
oxidizing the hydroxy acid with a first oxidizing agent and treating the resulting product with an alcohol in the presence of an acid to form a compound of the formula



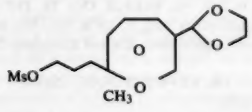
reacting the bis-hydroxymethyl compound with an alcohol in the presence of acid to form a compound of the formula



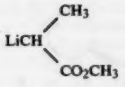
reacting the hydroxy ester with a second oxidizing agent, reacting the product formed with ethylene glycol and hydrolyzing the ester with a base to form a compound of the formula



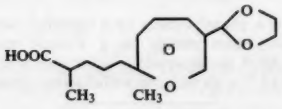
reacting the acid with borane-THF and the product formed with methanesulfonyl chloride to form a compound of the formula



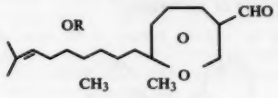
reacting the mesylate with a compound of the formula



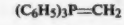
and hydrolyzing the ester to form a compound of the formula



reacting the acid with 3-methyl-2-butenyl lithium, reacting the ketone formed with a reducing agent, hydrolyzing the hydroxy acetal with aqueous hydrochloric acid and esterifying the hydroxy compound with an esterifying agent to form a compound of the formula



reacting the aldehyde with a compound of the formula



reacting the product formed first with borane-THF followed by treatment with an alkali metal hydroxide and hydrogen peroxide, oxidizing the product formed with a third oxidizing agent, hydrolyzing the ester with a base and treating the salt formed with a mineral acid, wherein R is a lower alkanoyl group having 2–6 carbon atoms, and Ms is a mesyl group.

4,277,402

SYNTHESIS OF POLYFORMALS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Algirdas C. Poshkus, Lancaster, Pa.

Filed Jul. 3, 1979, Ser. No. 54,501

Int. Cl.³ C07D *317/00;* C07C *43/30*

U.S. Cl. 260—340.9 R **7 Claims**

1. A process for the preparation of cyclic formals of polyhydroxy compounds of the formula $CH_2OH(CHOH)_nCH_2OH$ in which n ranges from about 2 to 4, which comprises heating a mixture consisting essentially of such polyhydroxy compound, a slight excess of paraformaldehyde and a catalytic quantity of an acid catalyst to a temperature within the range of about 105° to about 150° C. for a total period of about 10 minutes, such mixture being substantially devoid of water and refluxing agent.

4,277,403

PROSTAGLANDIN INTERMEDIATES

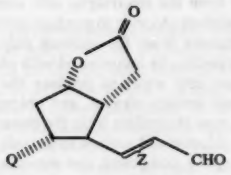
Jasjit S. Bindra, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 661,270, Feb. 25, 1976, Pat. No. 4,213,907. This application Dec. 10, 1979, Ser. No. 101,751

Int. Cl.³ C07D *307/93*

U.S. Cl. 260—343.3 P **5 Claims**

1. A compound of the formula:



wherein

Z represents a single bond or a trans double bond; and

Q is selected from the group consisting of hydrogen, tetrahydropyran-2-yloxy and dimethyl-t-butylsilyloxy with the proviso that when Z is a trans double bond, Q is hydrogen.

4,277,404

5-(4-FLUOROPHENYL)TETRAHYDRO-2-FURANOL

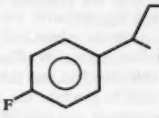
Willard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 5,698, Jan. 23, 1979, Pat. No. 4,224,329, which is a continuation-in-part of Ser. No. 799,392, May 23, 1977, abandoned. This application Jan. 16, 1980, Ser. No. 112,638

Int. Cl.³ C07D *307/02*

U.S. Cl. 260—347.8 **1 Claim**

1. Enantiomeric and racemic compounds of the formula



4,277,405

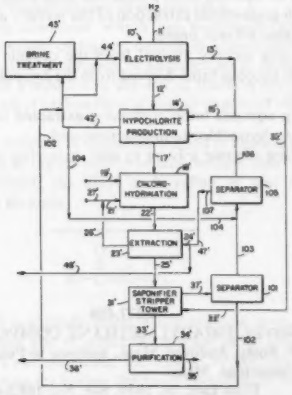
PRODUCTION OF EPOXY COMPOUNDS FROM OLEFINIC COMPOUNDS

George J. Apanel, Bloomfield, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed May 3, 1979, Ser. No. 35,560

Int. Cl.³ C07D *301/26;* C25B *3/02, 3/06*

U.S. Cl. 260—348.21 **13 Claims**



1. In a process for producing an epoxy compound which is integrated with the electrolytic production of chlorine

wherein a tertiary alkanol is contacted with chlorine and aqueous electrolyte from the electrolytic cell, containing sodium hydroxide and sodium chloride to produce tertiary alkyl hypochlorite and aqueous brine for ultimate recycle to the cell, tertiary alkyl hypochlorite is contacted with olefinically unsaturated compound and water to produce the corresponding chlorohydrin and tertiary alkanol, and chlorohydrin is contacted with aqueous electrolyte from the electrolytic cell containing sodium chloride and sodium hydroxide to produce the corresponding epoxy compound and aqueous brine for ultimate recycle to the cell, the improvement comprising:

extracting organics from the chlorohydrin production with an organic extraction solvent to produce an organic extract containing chlorohydrin and tertiary alkanol; contacting organic extract with the aqueous electrolyte containing sodium chloride and sodium hydroxide to saponify chlorohydrin to the corresponding epoxy compound;

recovering epoxy compound;

separating from the saponification an organic solvent phase and an aqueous phase, said separation being effected with preferential extraction of the tertiary alkanol into the organic solvent phase;

extracting tertiary alkanol from the organic solvent phase with an aqueous phase derived from the hypochlorite production;

passing said aqueous phase derived from the hypochlorite production containing extracted tertiary alkanol to said hypochlorite production; and

recycling organic solvent to said extracting of organics.

7. In a process for producing an epoxy compound wherein a tertiary alkanol is chlorinated in the presence of an aqueous base to produce tertiary alkyl hypochlorite, the tertiary alkyl hypochlorite is contacted with an olefinically unsaturated compound and water to produce a reaction effluent containing water, tertiary alkanol and chlorohydrin, and the chlorohydrin is saponified with aqueous base to produce the corresponding epoxy compound, the improvement comprising:

extracting organics from the chlorohydrin production with an organic extraction solvent, said organics including the chlorohydrin and tertiary alkanol;

contacting organic extract containing chlorohydrin and tertiary alkanol, and an aqueous base to effect saponification of the chlorohydrin to the corresponding epoxy compound;

recovering the epoxy compound produced in the saponification;

separating from the saponification an organic solvent phase and an aqueous brine phase, said separating being effected with preferential extraction of the tertiary alkanol into the organic solvent phase;

extracting tertiary alkanol from the organic solvent phase with aqueous brine derived from the hypochlorite production;

passing aqueous brine containing extracted tertiary alkanol to the hypochlorite production; and

recycling organic solvent to said extracting of organics.

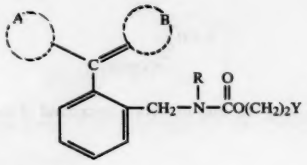
4,277,406

NOVEL TRIARYLMETHANE COMPOUNDS

James W. Foley, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1979, Ser. No. 106,899
Int. Cl.³ C09B 11/10
U.S. Cl. 260—389 **9 Claims**

1. A compound of the formula



wherein A is a phenyl moiety or a naphthyl moiety; B is a 4′-oxo-1′-phenylidene moiety or a 4′-oxo-1′-naphthylidene moiety; R is alkyl, unsubstituted or substituted with a solubilizing group, and Y is an electron-withdrawing group.

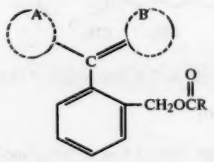
4,277,407

NOVEL TRIARYLMETHANE COMPOUNDS

James W. Foley, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1979, Ser. No. 106,900
Int. Cl.³ C09B 11/10
U.S. Cl. 260—390 **15 Claims**

1. A compound of the formula



wherein A is a phenyl moiety or a naphthyl moiety; B is a 4′-oxo-1′-phenylidene moiety or a 4′-oxo-1′-naphthylidene moiety and R is selected from hydrogen; alkyl, unsubstituted or substituted with halo, alkoxy, carboxy-substituted alkoxy, phenoxy or phenyl; or phenyl, unsubstituted or substituted in the m- or p-position with halo, alkoxy, nitro, dimethylamino or alkyl.

4,277,408

NOVEL PURIFICATION PROCESS

Charles Pavan, Nogent-sur-Marne, and Jacques Bulidon, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Nov. 27, 1979, Ser. No. 97,710
Claims priority, application France, Dec. 11, 1978, 78 34767
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.1 **8 Claims**

1. A process for the preparation of purified 3α,7α-dihydroxy-(5β)-cholanic acid comprising crystallizing chenodesoxycholic acid containing approximately 2% of other bile acids from a methylene chloride solvent system to obtain a purified chenodesoxycholic acid containing less than 1% of foreign bile acids of which is less than 0.1% lithocholic acid.

4,277,409

PREPARATION OF 9α-FLUORO-16α-METHYL-21-ACETOXY-$\Delta^{1,4}$-PREGNADIENE-11β-OL-3,20-DIONE

Julien Warnant, Neuilly-sur-Seine, and Jean Jolly, Fontenay-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

Continuation of Ser. No. 886,122, Mar. 13, 1978, abandoned.
This application Nov. 16, 1979, Ser. No. 94,772
Int. Cl.³ C07J 5/00
U.S. Cl. 260—397.45 **13 Claims**

1. In the process for the preparation of pure 9α-fluoro-16α-methyl-21-acetoxy-$\Delta^{1,4}$-pregnadiene-11β-ol-3,20-dione com-

prising reacting 9α-fluoro-21-acetoxy-$\Delta^{1,4,16}$-pregnatriene-11β-ol-3,20-dione with a methyl magnesium halide in the presence of a catalytic amount of a cuprous halide effecting protonation of magnesium to form 9α-fluoro-16α-methyl-21-acetoxy-$\Delta^{1,4}$-pregnadiene-11β-ol-3,20-dione, treating the reaction mixture with methanol, reacting the raw product with an acetylation agent to acetylate the partially deacetylated product and purifying the reacetylated product with an organic solvent, the improvement comprising treating the solution with a peroxidation agent to epoxidize the impurity, and then removing the epoxidized impurity with an organic solvent.

4,277,410

PROCESS FOR THE PRODUCTION OF CARBOXYLIC AMIDES USING ALKYLTIN CATALYSTS

Thomas Z. Li, and James Lamont, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed May 2, 1980, Ser. No. 145,925

Int. Cl.³ C09F *5/00;* C11C *3/00*

U.S. Cl. 260—404 **8 Claims**

1. An improved process for the preparation of amides which comprises reacting an aliphatic, cycloaliphatic or aromatic carboxylic acid containing from 6 to 24 carbon atoms, or ester or anhydride thereof, with ammonia at a temperature of 100° C. to 220° C. in the presence of 0.1 to 10 wt. percent, based on the carboxylic acid, of a alkyltin catalyst of the formula $RSnX_3$ or R_2SnX_2 where R is a hydrocarbon radical having from 1 to 12 carbon atoms and X is hydroxyl, halo or carboxylate having from 2 to 6 carbon atoms.

4,277,411

EXTRACTION OF OIL FROM VEGETABLE MATERIALS

Kenneth R. Yahl, Orland Park, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 945,268, Sep. 25, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,743

Int. Cl.³ C11B *1/00*

U.S. Cl. 260—412.4 **6 Claims**

1. A process for extracting oil from essentially whole corn germ obtained by the wet milling of corn consisting essentially of the steps of: shredding the germ, containing between about 25% and about 55% water by weight, by passing it between rolls under pressure; directly drying the shredded germ to a moisture content of less than about 15% by weight; and extracting said dried shredded germ with an oil solvent.

4,277,412

FRACTIONATION OF TRIGLYCERIDE MIXTURES

Ted J. Logan, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jan. 2, 1980, Ser. No. 108,985

Int. Cl.³ C09F *5/10*

U.S. Cl. 260—428.5 **16 Claims**

1. A process for separating a mixture of triglycerides with different Iodine Values and having their carboxylic acid moieties containing from 6 to 26 carbon atoms, to produce fractions of higher Iodine Value and lower Iodine Value, said process comprising the steps of

(a) contacting a solution of said mixture in solvent with permutite absorbent to selectively adsorb triglyceride of higher Iodine Value and to leave in solution a fraction of said mixture enriched in content of triglyceride of lower Iodine Value,

(b) removing solution of fraction enriched in content of triglyceride of lower Iodine Value from contact with adsorbent which has selectively adsorbed triglyceride of higher Iodine Value,

(c) contacting adsorbent which has selectively adsorbed triglyceride of higher Iodine Value with solvent to cause desorption of adsorbed triglyceride and provide a solution in solvent of fraction enriched in content of triglyceride of higher Iodine Value,

(d) removing solution of fraction enriched in content of triglyceride of higher Iodine Value from contact with adsorbent;

said mixture of triglycerides being essentially free of impurities which can foul the adsorbent; the solvent in step (a) and the solvent in step (c) having the same composition or different compositions and being characterized by a solubility parameter (on a 25° C. basis) ranging from about 7.0 to about 15.0, a solubility parameter dispersion component (on a 25° C. basis) ranging from about 7.0 to about 9.0, a solubility parameter polar component (on a 25° C. basis) ranging from 0 to about 6.0 and a solubility parameter hydrogen bonding component (on a 25° C. basis) ranging from 0 to about 11.5; said adsorbent being characterized by a ratio of silicon atoms to aluminum atoms ranging from about 3:1 to about 20:1 and a surface area (on a 100% sodium substitution basis) of at least about 100 square meters per gram; said adsorbent having cation substituents selected from the group consisting of cation substituents capable of forming π complexes and cation substituents not capable of forming π complexes and combinations of these; said adsorbent being in the form of particles which (on a bulk water free and solvent free basis) are substantially completely permutite adsorbent and which have a size ranging from about 200 mesh to about 20 mesh and which have a water content less than about 10% by weight; the solvent in step (a) and the solvent in step (c) and the ratio of silicon atoms to aluminum atoms in the adsorbent and the level of cation substituents capable of forming π complexes being selected to provide selectivity in step (a) and desorption in step (c).

4,277,413

FRACTIONATION OF ALKYL CARBOXYLATE MIXTURES

Ted J. Logan, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 2, 1980, Ser. No. 109,020

Int. Cl.³ C09F *5/10*

U.S. Cl. 260—428.5 **18 Claims**

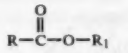
1. A process for separating an alkyl carboxylate mixture according to degree of unsaturation, said process comprising the steps of

(a) contacting a solution of said mixture in solvent with permutite adsorbent to selectively adsorb alkyl carboxylates of higher degree of unsaturation and to leave in solution in solvent a fraction of said mixture enriched in content of alkyl carboxylate of lesser degree of unsaturation,

(b) removing solution of fraction enriched in content of alkyl carboxylate of lesser degree of unsaturation from contact with adsorbent which has selectively adsorbed alkyl carboxylate of higher degree of unsaturation,

(c) contacting adsorbent which has selectively adsorbed alkyl carboxylate of higher degree of unsaturation with solvent to cause desorption of adsorbed alkyl carboxylate and provide a solution in solvent of fraction enriched in content of alkyl carboxylate of higher degree of unsaturation,

(d) removing solution of fraction enriched in content of alkyl carboxylate of higher degree of unsaturation from contact with adsorbent; the alkyl carboxylate in said mixture having the formula



in which R is aliphatic chain which contains from 5 to 25 carbon atoms and in which R_1 is alkyl chain containing from 1 to 4 carbon atoms; the solvent in step (a) and the solvent in step (c) having the same composition or different compositions and being characterized by a solubility parameter (on a 25° C. basis) ranging from about 7.0 to about 15.0, a solubility parameter dispersion component (on a 25° C. basis) ranging from about 7.0 to about 9.0, a

solubility parameter polar component (on a 25° C. basis) ranging from 0 to about 6.0 and a solubility parameter hydrogen bonding component (on a 25° C. basis) ranging from 0 to about 11.5; said adsorbent being characterized by a ratio of silicon atoms to aluminum atoms ranging from about 3:1 to about 20:1 and a surface area (on a 100% sodium substitution basis) of at least about 100 square meters per gram; said adsorbent having cation substituents selected from the group consisting of cation substituents capable of forming π complexes and cation substituents not capable of forming π complexes and combinations of these; said adsorbent being in the form of particles which (on a bulk water free and solvent free basis) are substantially completely permutite adsorbent and which have a size ranging from about 200 mesh to about 20 mesh and which have a water content less than about 10% by weight; the solvent in step (a) and the solvent in step (c) and the ratio of silicon atoms to aluminum atoms in the adsorbent and the level of cation substituents capable of forming π complexes being selected to provide selectively in step (a) and desorption in step (c).

4,277,414

PROCESS FOR PRODUCING CATALYST

Toshihiro Saito; Yukihiro Tsutsumi; Shoji Arai, and Hideaki Matsunaga, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,033
Claims priority, application Japan, Jan. 8, 1979, 54-000204
Int. Cl.³ C07F *15/00*
U.S. Cl. 260—429 R **4 Claims**

1. In a process for producing a trans-[hydridocarbonyl tris(-triorganic phosphine) rhodium (I)] by reducing a trans-[chlorocarbonyl bis(triorganic phosphine) rhodium (I)] with a tetrahydroborate in the presence of a triorganic phosphine in a solvent by heating, the improvement characterized in that the reduction is carried out in the presence of carbon monoxide or a mixture of more than 50 vol.% of carbon monoxide and an inert gas, and the reaction mixture is cooled to 0° to 30° C. in an atmosphere of carbon monoxide or a mixture of more than 50 vol.% of carbon monoxide and an inert gas and the crystal is separated.

4,277,415

PYROPHOSPHATO TITANATE ADDUCTS

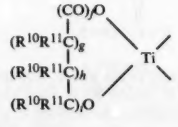
Gerald Sugerman, Allendale, N.J., and Salvatore J. Monte, Staten Island, N.Y., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Filed Aug. 29, 1979, Ser. No. 70,907
Int. Cl.³ C07F *7/28*
U.S. Cl. 260—429.5 **12 Claims**

1. A compound having the formula

$$X_cTi[OP(O)(OR^1)OP(O)(OR^2\text{-})(OR^3)]_{4-c}(NR^4R^5R^6)_d[P(OR^7)(OR^8)(OR^9)]_e$$

wherein c is 1 or 2; d is 0, 1 or 2; e is 0, 1 or 2; with the proviso that d plus e must be 1 or 2; with the proviso that if c is 1, X must be RO-; and with the proviso that when c is 2, X is either RO- or a group which taken together with the Ti to which it is attached forms a ring having the formula



VI

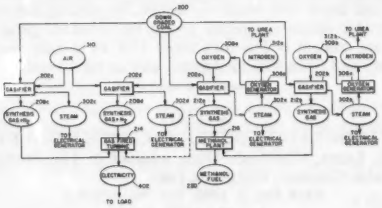
wherein each of f, g, h and i is 0 or 1, with the proviso that at least one of g, h, and i is 1 and that the sum of f, g, h and i is 2 or 3; and wherein each R is independently selected from C_1 to C_{10} alkyl, C_3 to C_{10} alkenyl, C_7 to C_{10} dioxyalkylene; R^1, R^2, R^4, R^7, each R^{10} and each R^{11} are independently selected from hydrogen, C_6 to C_{10} aryl, C_7 to C_{20} aralkyl, C_1 to C_{20} alkyl, C_3 to C_{20} alkenyl, C_2 to C_{20} oxyalkylene and C_3 to C_{20} oligooxyalkylene, with the proviso that one and only one of R^1 and R^2 is hydrogen; R^5, R^6, R^8 and R^9 are independently selected from the same groups as are R^1, R^2, R^4, R^7, each R^{10} and each R^{11}, except that R^5, R^6, R^8 and R^9 may not be hydrogen, and, in addition, R^5 and R^6 are independently selected from C_1 to C_{10} alkanol, C_2 to C_6 alkadiol, C_7 to C_{10} aralkanol, substituted and unsubstituted C_1 to C_{10} alkyl, substituted and unsubstituted C_3 to C_{10} aralkyl, these last four groups being optionally substituted with 1 to 3 carboxylate groups or from 1 to 3 carboxamide groups, each such carboxylate group and each such carboxamide group being saturated or unsaturated and having from 1 to 5 carbon atoms; with the proviso that when aromatic carbons are present in any one of R, R^2, R^4, R^7, R^{10} or R^{11}, each of said carbons is optionally substituted with 1 or 2 independently selected halogen atoms.

4,277,416

PROCESS FOR PRODUCING METHANOL

Norman A. Grant, Studio City, Calif., assignor to Aminoil, USA, Inc., Huntington Beach, Calif.

Filed Feb. 17, 1977, Ser. No. 769,608
Int. Cl.³ C07C *31/04*
U.S. Cl. 518—703 **9 Claims**



1. A process for converting coal to varying end products comprising:

gasifying coal in a plurality of gasifiers to produce a synthesis gas and heat;

converting at least part of said heat through a heat exchanger into steam;

directing during some time periods at least part of said synthesis gas to a methanol plant;

during the aforesaid time period inputting oxygen from an oxygen generator into at least some of the gasifiers;

inputting air during other time periods to said gasifiers;

directing at least part of the steam output from gasification to a steam turbine generator to produce electricity;

directing part of the steam from gasification to drive said oxygen generator during the first said time period when oxygen is used as a gasifier input; and

directing the entire steam output from gasification steam to said electric power generation during said other time period when air is used as the gasifier input.

4,277,417

HYDROCARBON SOLUBLE SULFONATED POLYOLS, ESTERS OF HYDROCARBON SUBSTITUTED C_4–C_{10} DICARBOXYLIC ACIDS WITH POLYOLS AND SULFONIC ACID, PROCESSES THEREFOR, AND LUBRICATING COMPOSITIONS THEREOF

Vijaya K. Varma, Belle Mead, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 385, Dec. 29, 1978, abandoned. This application Feb. 25, 1980, Ser. No. 124,085

Int. Cl.[3] **C10M** *1/20, 1/40;* **C07C** *143/68*

U.S. Cl. 260—456 R **18 Claims**

1. A hydrocarbon soluble partial sulfonate of a polyol comprising the product obtained from heating together a mixture consisting essentially of a polyol having at least three and up to eight hydroxy groups and containing a total of 2 to 40 carbons and a hydrocarbon soluble C_{12}–C_{80} hydrocarbyl substituted sulfonic acid at a temperature of from 100°–240° C. until sulfonation is complete by infrared analysis and/or cessation of water evolution.

4,277,418

METHOD OF PREPARING ALKOXYMETHYLENE COMPOUNDS

Otto Ackermann, Troisdorf Sieglar; Dieter Bretzinger, Lohmer; Herbert Schneidewind, and Rudolf Stephan, both of Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

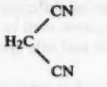
Continuation-in-part of Ser. No. 825,794, Aug. 9, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,096

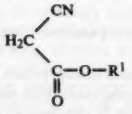
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635841

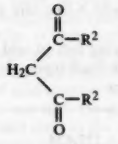
Int. Cl.[3] **C07C** *120/00, 121/30, 121/453, 121/413*

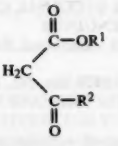
U.S. Cl. 260—465.4 **13 Claims**

1. In a process for the preparation of an alkoxymethylene malonic acid derivative which comprises contacting a compound selected from the group consisting of


(1)


(2)


(3)


(4)

wherein

R^1 is C_1 to C_3 alkyl, and

R^2 is methyl or ethyl

with an orthoformic acid trialkyl ester in the presence of a catalyst at a temperature of 80° to 165° C., the improvement residing in employing at least 1.6 moles of orthoformic acid ester per mole of said compound and carrying out the process in the presence of Lewis acid free catalyst consisting essentially of an anhydride of an aliphatic carboxylic acid of 2 to 4 carbon atoms, said anhydride in an amount of up to 50% of the total amount of anhydride to be employed being added to the reaction mixture before commencement of the reaction and the balance of the anhydride being added during the reaction continuously or in several portions, the alcohol being formed being removed during the process.

4,277,419

PREPARATION OF MUCONIC ACID MONONITRILES AND COPPER(II)-AMMONIA REAGENT THEREFOR

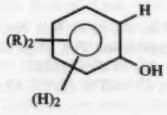
Timothy R. Demmin, Randolph, and Milorad M. Rogic, Whippany, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 942,507, Sep. 15, 1978, abandoned. This application Sep. 11, 1979, Ser. No. 74,442

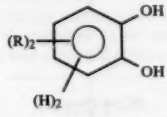
Int. Cl.[3] **C07C** *120/00, 121/413;* **C07F** *1/08*

U.S. Cl. 260—465.4 **23 Claims**

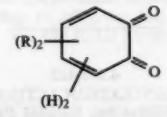
1. A process of reacting in the liquid phase a cyclic starting material selected from the group consisting of phenols of the formula:



catechols of the formula:



and orthobenzoquinones of the formula:



wherein R is independently at each occurrence H, alkyl, alkoxy, bromo, chloro, amino, phenyl or phenoxy, with a copper-(II)-ammonia reagent suspended in an organic solvent having a nitrogen with an unshared electron pair under reaction conditions forming a muconic acid mononitrile or copper salt thereof;

said copper(II)-ammonia reagent, when recovered from the organic solvent, having an empirical formula

$$(CuO)(CuX_2)_y(NH_3)_z$$

where X is a monovalent anion, y is between about 0.2 and about 1 and z is between about 2 and about 4.

20. A composition of matter selected from the group consisting of cis,cis-muconic acid mononitrile and its copper(II) salts.

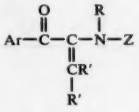
4,277,420

EPHEDRINE AND PSEUDOEPHEDRINE PRECURSORS

Karl E. Koenig, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 24, 1979, Ser. No. 78,111
Int. Cl.³ C07C *103/20, 103/75*
U.S. Cl. 560—24 21 Claims

1. As new compounds, the compounds represented by:



in which Ar represents substituted or unsubstituted phenyl. each R and R′ are independently selected from hydrogen, lower alkyl and aryl, and Z is selected from substituted or unsubstituted acyl.

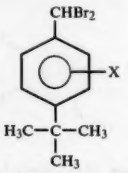
4,277,421

PROCESS FOR THE MANUFACTURE OF PARA-TERT.BUTYLBENZALDEHYDE AND ITS DERIVATIVES WHICH ARE HALOGEN-SUBSTITUTED AT THE NUCLEUS

Franz Landauer, Frankfurt am Main, and Georg Schaeffer, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 94,058
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849692; Mar. 22, 1979, 2911237
Int. Cl.³ C07C *25/02, 45/43*
U.S. Cl. 570—185 3 Claims

1. A compound of the formula



wherein X is hydrogen, fluorine, chlorine, bromine or iodine.

4,277,422

VULCANIZATION ACTIVATOR

Herbert Mueller, Frankenthal; Gerhard Paulus; Hubert Schoeppl, both of Weinheim, and Emil Scharf, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 834,413, Sep. 19, 1977, abandoned. This application May 7, 1979, Ser. No. 36,861
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645170
Int. Cl.³ C08C *19/20*
U.S. Cl. 260—791 9 Claims

1. A process for the manufacture of vulcanized rubber, comprising:

adding a vulcanizing agent and one or more vulcanizing activators, said activators containing the crystalline reaction product of formaldehyde and 1,3-propylene diamine, to the rubber, and

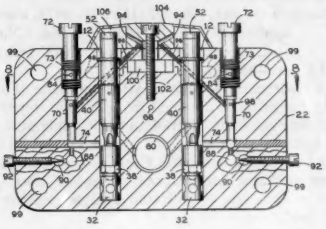
heating the mixture.

4,277,423

FUEL CALIBRATION DEVICE FOR CARBURETOR

Robert W. Noguez, 5660 NW. 78th Ave., Miami, Fla. 33166

Filed Feb. 13, 1980, Ser. No. 121,129
Int. Cl.³ F02M *19/06*
U.S. Cl. 261—34 R 8 Claims



1. A fuel calibration device for use with a carburetor and fuel bowl of an internal combustion engine to calibrate fuel flow, comprising:

block means for receiving fuel metering systems;

means forming a main well in said block means;

main jet means received in said main well for metering main fuel flow;

emulsion tube means received in said main well above said jet means for emulsifying fuel with air;

air corrector means received in said main well above said emulsion tube means for introducing air into the fuel at said emulsion tube means;

said main jet means and said emulsion tube means and said air corrector means being united in a main assembly that is removable from said main well when said block means is attached to said carburetor to permit replacement with a like main assembly having different characteristics;

means forming an idle system well in said block means;

idle jet means received in said idle system well for metering idle fuel flow;

and holder means received in said idle system well above said idle jet means;

air bleed means for metering and introducing air into the idle fuel flow;

said idle jet means and said holder means being united in an idle assembly that is removable from said idle system well when said block means is attached to said carburetor to permit replacement with a like idle assembly having different characteristics;

supply means for supplying fuel to said wells;

and discharge means for discharging fuel and air from said wells to the carburetor.

4,277,424

CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Charles B. Shivers, Jr., 8928 Valleybrook Rd., Birmingham, Ala. 35206

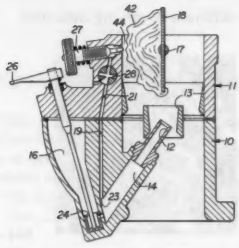
Filed Dec. 21, 1979, Ser. No. 105,919
Int. Cl.³ F02M *3/02*
U.S. Cl. 261—41 D 2 Claims

1. In a carburetor for internal combustion engines of the kind having a main jet supplied by a fuel passage, and an idle jet having a fuel supply passage in communication with said main jet fuel supply passage, the improvement comprising,

(a) a vent from the idle jet passage to atmosphere,

(b) a valve controlling the idle jet passage ported so that in a first position the idle jet passage is connected to said vent and in a second position the idle jet passage is connected only to the idle jet, and

(c) means operatively connected to the valve to move the same from said second to said first position when the main



jet becomes the sole source of fuel flow through the carburetor.

4,277,425

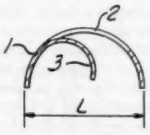
TOWER PACKING ELEMENT

Max Leva, 2160 Greentree Rd., Pittsburgh, Pa. 15220

Division of Ser. No. 887,604, Mar. 17, 1978, Pat. No. 4,203,934, which is a continuation-in-part of Ser. No. 749,272, Dec. 10, 1976, abandoned, which is a continuation of Ser. No. 586,529, Jun. 13, 1975, abandoned. This application May 16, 1980, Ser. No. 150,437

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—98 **12 Claims**



1. In a packing for a vapor- or gas-liquid contact tower and the like, a plurality of randomly packed, mutually interlocking packing elements providing a bed having substantial physical stability, each packing element comprising an open-ended curved strip being molded of plastic exhibiting curvature only in a single direction and the curvature extending through an angular range of about 90 to 180 degrees, said strip having a plurality of tongues, being molded of plastic, selected ones of which are different lengths and extending only inwardly of the curvature of said strip, at least one slot extending along said single direction in said curved strip, the surface of said strip and tongues being otherwise smooth and free of small perforations, at least one of said tongues extending for at least a distance equal to about one-fifth the distance from its base at the concave surface of said strip to the center between the ends of said strip, so as to permit interlocking with and prevent nesting with adjacent packing elements and provide a homogeneous packing.

4,277,426

METHOD FOR PRODUCTION OF COAGULATED SYNTHETIC POLYMER LATEX

Shingi Kato, Takasago; Nobuo Ogawa; Norio Kawanami, both of Akashi, and Takashi Onda, Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

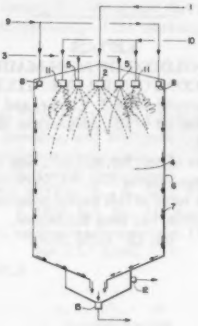
Filed Nov. 27, 1979, Ser. No. 97,895

Claims priority, application Japan, Aug. 20, 1979, 54/106278

Int. Cl.³ B01J *2/04*

U.S. Cl. 264—8 **6 Claims**

1. A method for coagulating a latex of a synthetic polymer at a coagulated latex particle formation temperature at which pluralities of polymer particles coagulate in droplets of the latex to form coagulated latex particles, without causing agglomeration of the coagulated latex particles to form substantially spherical particles, the method which comprises coagulating said latex by dispersing substantially spherical droplets of it, the droplets having a size distribution such that not more than 20% have a diameter smaller than 53 microns and the remainder have a diameter of 2 mm or less, into a coagulating atmosphere selected from the group consisting of: (i) a gaseous coagulant; and (ii) a liquid coagulant in the form of a mist comprising liquid drops having diameters such that the terminal settling velocity of the drops under free-falling conditions



is in accordance with Stokes' Law, said coagulation atmosphere being maintained at the coagulated latex particle formation temperature and being contained in a vertically disposed coagulation chamber having side walls with inner surfaces, while causing water to flow downward over the inner surfaces as a liquid recovery medium, the water being maintained at the coagulated latex particle formation temperature to recover the coagulated latex particles having a substantially spherical shape, contact being maintained between the droplets of latex and the coagulating atmosphere for a period between 0.6 to 3 seconds effective to permit said droplets to absorb about 0.36 to 8% by weight of coagulant based on the weight of the polymer to stabilize said coagulated latex particles.

4,277,427

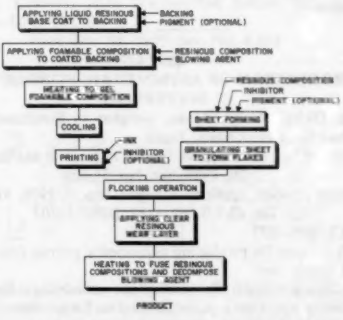
RANDOMLY EMBOSSED SURFACE COVERING

Stanley J. Kaminski, Trenton; Robert D. Mansolillo, Bloomfield, and Eugene A. Wilmer, Pennington, all of N.J., assignors to Congoleum Corporation, Kearny, N.J.

Filed Sep. 27, 1979, Ser. No. 79,296

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—45.5 **16 Claims**



1. In a process for producing a wear resistant, multilayered

resinous assembly on a base, said process comprising the steps of: forming into a layer a foamable resinous polymer composition containing a blowing agent; heating to gel said layer; printing a design on said layer with ink; applying a wear layer thereto, and; heating the resulting assembly to the decomposition temperature of said blowing agent; the improvement which comprises randomly distributing flakes of a resinous composition containing an inhibitor for said blowing agent onto the printed surface of the gelled foamable resinous polymer composition, applying a clear wear layer thereto, and heating the resulting assembly to effect the inhibition reaction and, thereafter, to decompose the blowing agent and fuse the resinous compositions so as to effect expansion at the sites of decomposition.

4,277,428

POST-PRESS MOLDING OF MAN-MADE BOARDS TO PRODUCE CONTOURED FURNITURE PARTS

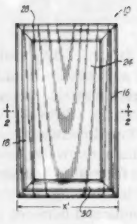
Allan J. Luck, Harvard; John T. Clarke, and Roger F. Sutton, both of St. Charles, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 833,037, Sep. 14, 1977, Pat. No. 4,175,106. This application Nov. 19, 1979, Ser. No. 95,627

The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.³ B29J *5/00*

U.S. Cl. 264—118 **16 Claims**



1. A method of molding a cellulosic fiber containing board to form a three dimensional contoured part comprising:

(a) compressing and heating a fibrous mass of cellulosic fibers to bond the fibers into a consolidated blank;

(b) cutting the consolidated blank to a size larger than the interior dimensions of said mold cavity in each of its three dimensions;

(c) inserting said cut blank in the open cavity of said contoured mold;

(d) closing said mold;

(e) hot-pressing said consolidated, cut blank in said mold at a temperature of 200° F. to 650° F. to form a contoured, molded product; and

(f) opening said mold and removing said molded, contoured part.

4,277,429

PRODUCTION OF ASYMMETRIC POROUS FILM MATERIALS

Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 830,288, Sep. 2, 1977. This application Apr. 20, 1979, Ser. No. 31,804

Claims priority, application Japan, Sep. 3, 1976, 51-105912

Int. Cl.³ B29D *7/24;* **B29C** *17/02*

U.S. Cl. 264—127 **4 Claims**

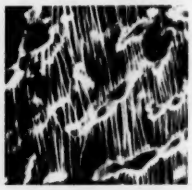
1. A process for producing asymmetric porous film materials which comprises

molding a polytetrafluoroethylene containing a liquid lubricating agent by a paste method to form a film,

removing the liquid lubricating agent, and

generating a temperature difference simultaneously with a compressive force in the thickness direction of the film during stretching the film at a temperature lower than the sintering temperature of the polytetrafluoroethylene using rolls

which have a different revolving ratio and



which have a temperature difference between each other, whereby tension is caused by the stretching direction of the film while a compressive force corresponding to the tension is caused in the thickness direction of the film.

4,277,430

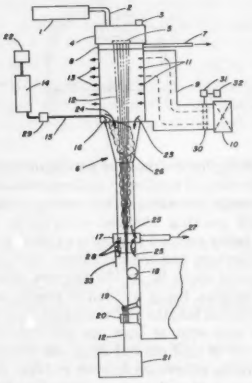
QUENCH PROCESS FOR SYNTHETIC FIBERS USING FOG AND FLOWING AIR

Frank L. Peckinpaugh, and Raymond J. Biron, both of Colonial Heights, Va., assignors to Allied Chemical Corporation, Morristown, N.J.

Division of Ser. No. 930,119, Aug. 1, 1978, Pat. No. 4,204,828. This application Dec. 6, 1979, Ser. No. 100,755

Int. Cl.³ B29H *21/04;* **B29C** *25/00*

U.S. Cl. 264—129 **4 Claims**



1. A method to quench freshly spun synthetic multifilament fibers in a quench stack using fog and air comprising

spinning synthetic multifilament fiber from its molten synthetic polymer through a spinnerette into a quench stack,

quenching the freshly spun fiber in the quench stack first with flowing air and then with a combination of flowing air and water in the form of a fog generated from an airless atomizer, and

taking up said fiber onto a wound package, while

controlling said air flow, and

controlling the rate of formation of said fog,

providing one nozzle for each two bundles of multifilament fiber per stack, controlling said air flow to a supply of from about 0.01 to 0.15 scfm per pound of polymer per minute, controlling said formation of fog by atomizing water at a rate of from 2 ounces of water per minute per pound of polymer per minute to about 4.5 ounces of water per minute per pound of polymer per minute at a pressure of about 400 to 720 at the

nozzle of said atomizer, locating said nozzle at about 6 feet below said spinnerette, so that a spinning and quench system designed for high throughput feeder yarn for staple can produce high quality feeder yarn for continuous filament processing.

4,277,431

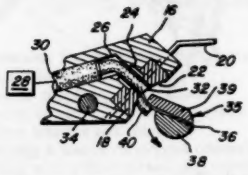
METHOD OF DISPENSING METERED CHARGES OF MATERIAL

William N. Peller, Crawfordsville, Ind., assignor to H-C Industries, Inc., Crawfordsville, Ind.

Continuation of Ser. No. 856,138, Nov. 30, 1977, abandoned, which is a division of Ser. No. 719,836, Sep. 2, 1976, Pat. No. 4,080,136. This application May 21, 1979, Ser. No. 41,097

Int. Cl.³ B29B *5/06;* B29C *17/14*

U.S. Cl. 264—148 **3 Claims**



1. A method of providing a metered charge of material to a receiving means each time the receiving means, which moves at a predetermined rate within a range of operable rates, is in a predetermined position, which comprises: extruding material through a feed orifice; rotating cutting means having a substantial flexible and resilient cutting blade with a distal end which is operably positioned with respect to said feed orifice so that said distal end travels at an average tangential velocity; severing the extruding portion of said extruded material by periodically contacting the extruded material with said cutting means; bending said cutting blade backwardly by providing a surface which said cutting blade contacts; and releasing said cutting blade from said surface so that said cutting blade snaps forwardly to impart a velocity to the severed portion which is greater than the average tangential velocity of the distal end of said cutting blade to direct to said severed portion to said receiving means.

4,277,432

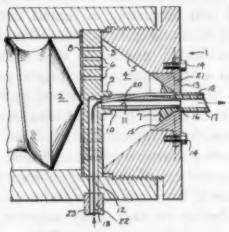
METHOD FOR EXTRUDING CATHETER TUBING

Willis E. Woinowski, Racine, Wis., assignor to Vesta, Inc., Milwaukee, Wis.

Filed Oct. 30, 1979, Ser. No. 89,506

Int. Cl.³ B29F *3/10*

U.S. Cl. 264—173 **5 Claims**



1. In a method of encapsulating a flexible preformed incompletely cured marking thread of X-ray opaque elastomeric material into the wall of tubing of elastomeric material during an extrusion operation which comprises, the steps of extruding the tubing elastomeric material through an opening between a pair of dies in a flow path initially varying in cross-section in a downward extent and then terminating into a flow path having a constant cross-section area, and introducing the thread of elastomeric material into the elastomeric material disposed to form the tube in the area of the dividing line wherein the flow path of the extruder tubing material changes from varying to constant to prevent blocking of the passage through which the thread is introduced into the extruded material with consequent stretching of the thread, or prevent entry of air into the extruded elastomeric material and the consequent forming of undesirable air passages adjacent to the thread in the final tubing and fully curing the tubing and thread to complete the tubing and the encapsulating of the marking thread in the wall of the tubing.

4,277,433

PROCESS FOR TERNARY POLYAMIDE FILAMENTS

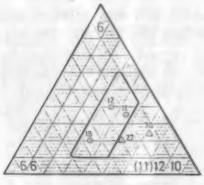
Eduard Schmid, Bonaduz, and Wolfgang Griehl, Chur, both of Switzerland, assignors to Inventa AG für Forschung und Patentverwertung, Zurich, Switzerland

Division of Ser. No. 867,646, Jan. 6, 1978. This application Feb. 1, 1980, Ser. No. 117,520

Claims priority, application Switzerland, Oct. 1, 1977, 230/77

Int. Cl.³ B29G *7/00*

U.S. Cl. 264—289.3 **2 Claims**



1. A process for the production of oriented crystalline filaments comprising a copolyamide derived from at least three polyamide-forming, unbranched, saturated, randomly distributed monomer components, having an average amide group frequency of one —CONH— to 6.4–7.4 —CH_2—, and in which each of said monomer components is present in an amount of 10–60 mol %, based on the number of mols of all said components and the sum of the mol % amounts of all components is 100, said copolyamide having a melting point of less than 155° C., said process comprising spinning said components into filaments and stretching said filaments.

4,277,434

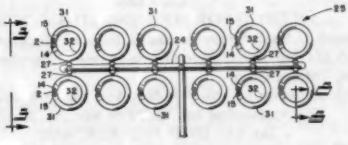
INJECTION MOLDING RESILIENT RING CLIP

Gerald A. Conway, 3570 Warrensville Center Rd., Shaker Heights, Ohio 44122

Filed Jan. 18, 1979, Ser. No. 4,453

Int. Cl.³ B29F *1/00*

U.S. Cl. 264—297 **4 Claims**



1. A method of producing resilient ring clips comprising the steps of: providing a two-part injection mold having therein, when closed, a substantially toroidal shape cavity for forming an open-ended ring clip that has a small gap between the ends

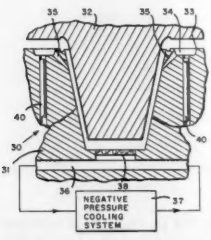
thereof resulting from incomplete revolution of the toroid-generating closed plane curve around the toroid-generating axis of rotation, such cavity further being shaped to provide a flattened area extending along a side of each of the ends of the ring clip for a short distance from the tip of each end which flattened areas are on axially opposite sides of the ring clip and approximately normal to the axis, a hole in the flattened area of one of the ends, and a pin projecting from and approximately normal to the flattened area of the other of the ends, which pin fits snugly into the hole when the two ends are brought into overlapping relationship and the two flattened areas into substantial, facing contact, and such cavity further being shaped such that the ring clip when thusly closed is of substantially uniform cross-sectional shape; assembling and closing the mold parts along a parting face lying in the plane of the ring clip shape cavity; injecting material into the cavity in the closed mold to form the ring clip; and then opening the mold and removing the ring clip therefrom.

4,277,435

PLASTIC TUMBLER AND METHOD AND APPARATUS FOR MAKING SAME

Paul E. Allen, Newtown, Conn., assignor to Logic Devices, Inc., Bethel, Conn.

Filed Mar. 28, 1979, Ser. No. 24,814
Int. Cl.³ B29F *1/00*
U.S. Cl. 264—328.12 **5 Claims**



1. A method for molding a plastic container having a closed bottom, a circular wall extending upwardly therefrom and a top circular rim on said wall comprising the steps of forming a closed mold cavity defining the shape of said plastic container, injecting plastic material into said cavity in a common direction at a plurality of spaced points at least adjacent the rim-forming portion of the cavity and at an angle substantially tangential thereto to fill the rim-forming portion with a peripheral circular movement of said plastic material and cause said plastic material to swirl around and down into the side wall-forming portion of the cavity towards and into the bottom-forming portion of the cavity while evacuating at least some of the gas present in the cavity through the bottom-forming portion of the cavity, to form a plastic container having improved strength due to the plastic material in the rim and wall thereof having been introduced in a circular swirl pattern.

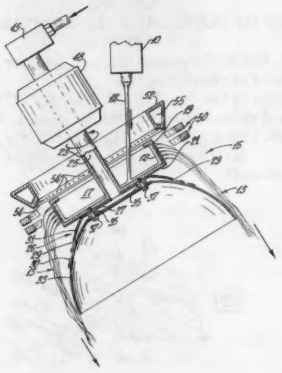
4,277,436

METHOD FOR FORMING FILAMENTS

Hashmuk G. Shah, Granville, and G. Richard Machlan, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 900,408, Apr. 26, 1978, abandoned. This application Jul. 12, 1979, Ser. No. 57,138
Int. Cl.³ D01D *5/12*; B29C *6/00*
U.S. Cl. 264—518 **8 Claims**

1. A method of forming filaments comprising:
forming a generally cylindrical rotating veil of interengaging primary fibers from a rotor containing filament forming material;
advancing said veil substantially along a path of advancement along the axis of rotation of said rotor;
supplying a fluid to the interior of the veil by a conduit having a discharge orifice within said veil;
providing a continuous surface of revolution within said veil along the path of advancement of said veil;



and moving the fluid over the exterior of said surface according to the Coanda effect along the axis of rotation into engagement with said veil to attenuate said primary fibers into filaments.

4,277,437

KIT FOR CARRYING OUT CHEMICALLY INDUCED FLUORESCENCE IMMUNOASSAY

Edward T. Maggio, Redwood City, Calif., assignor to Syva Company, Palo Alto, Calif.

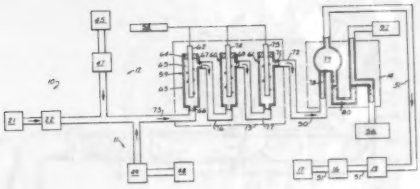
Continuation of Ser. No. 893,910, Apr. 5, 1978, Pat. No. 4,220,450. This application Dec. 10, 1979, Ser. No. 101,935
The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.
Int. Cl.³ G01N *33/54, 33/58*
U.S. Cl. 422—61 **4 Claims**

1. A diagnostic kit for use in a method for determining in an assay solution, the presence of an analyte in a sample suspected of containing said analyte, said analyte being a member of an immunological pair consisting of ligand and antiligand, said ligand having at least one epitopic site and said antiligand being capable of specifically binding to said epitopic site of said ligand; wherein a light emitting reciprocal pair are employed as labels, said light emitting reciprocal pair consisting of a chemiluminescence source having at least one component and a quencher capable of quenching the light emitted by said chemiluminescence source without collision, said labels being conjugated to members of said immunological pair to form a chemiluminescence label conjugate and a quencher label conjugate, and wherein in said assay solution the amount of quencher brought within quenching distance of said chemiluminescence source is related to the amount of analyte in said assay medium; said kit comprising in relative amount to substantially optimize said method, said chemiluminescence label conjugate and said quencher labeled conjugate.

4,277,438
METHOD AND APPARATUS FOR MEASURING THE AMOUNT OF CARBON AND OTHER ORGANICS IN AN AQUEOUS SOLUTION

Edward M. Ejzak, Friendswood, Tex., assignor to Astro Resources Corporation, League City, Tex.

Filed Sep. 4, 1979, Ser. No. 72,424
Int. Cl.³ G01N *31/12*; B01J *19/08*
U.S. Cl. 422—80 **7 Claims**



1. An apparatus for measuring the amount of oxidizable chemicals in a solution, comprising:

first means for supplying a test solution

second means connected to said first means for introducing an oxidizer into the test solution;

means defining a source of oxygen connected to and communicating with a third means, said third means introducing oxygen into the test solution, in said first means, prior to irradiation of the test solution;

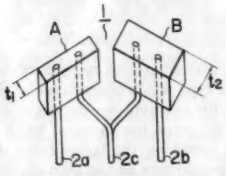
a multistage reactor, said reactor having a plurality of individual, separated stages, each of said stages having an input aperture and an output aperture, each of said stages having an ultraviolet lamp at least partly internal to said stage, said lamp being adapted to directly contact the test solution, said input apertures being lower than said output apertures to permit oxygen introduced into the test solution to scrub off insoluble gases formed by oxidation of the test sample, said input aperture of the initial said stage being in fluid communication with said first, second and third means, conduit means being connected to said output aperture of each stage and being in fluid communication with said input aperture of the succeeding said stage, said output aperture of the final said stage being in fluid communication with a reactor output; and

detector means for detecting carbon dioxide, said detector means being in fluid communication with said reactor output.

4,277,439
GAS COMPONENT DETECTOR

Eturo Yasuda, Okazaki, and Minoru Ohta, Anjo, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 18, 1979, Ser. No. 86,039
Claims priority, application Japan, Oct. 25, 1978, 53/131230
Int. Cl.³ G01N *27/12*
U.S. Cl. 422—94 **10 Claims**

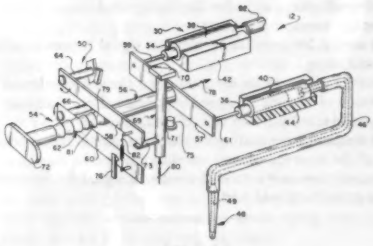


1. A gas component detector comprising a first gas component detecting element formed by a metal oxide having an electric resistance depending on the concentration of gas components and on the temperature of a detected gas and having a relatively fast response time in response to the variation of concentration of gas components; a second gas component detecting element formed by a metal oxide having the same temperature co-efficient of electric resistance as that of said first gas component detecting element and having an electric resistance variable to the same extent as that of said first detecting element depending on the concentration of gas components and on the temperature of the detected gas and having a slower detection response time against the concentration of gas components in the detected gas than that of said first gas component detecting element; electrodes provided in said first and second gas component detecting elements at positions capable of detecting an electric resistance depending on the concentration of gas components and on the temperature of the detected gas; and a catalyzer carried on said first and second detecting elements whereby a value of electric resistance corresponding to the concentration of gas components and the temperature of the detected gas is derived.

4,277,440
METERING APPARATUS

Thomas C. Jessop, Webster, and William L. Smith, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 2, 1979, Ser. No. 54,064
Int. Cl.³ G01N *35/00, 1/14*
U.S. Cl. 422—100 **15 Claims**



1. A metering device for use in apparatus for the analysis of biological fluids, said device being adapted to meter a predetermined quantity of fluid onto a test element containing reagents for the testing of a particular analyte, said analyzer being adapted to measure a change in said element which is indicative of the amount of analyte in said fluid, said device comprising:

a metering tip having a fluid chamber for receiving fluid aspirated into said tip through an aperture therein;

pump means in fluid communication with said metering tip, said pump means being adapted to draw fluid into said tip and to expel fluid therefrom in precise amounts; and

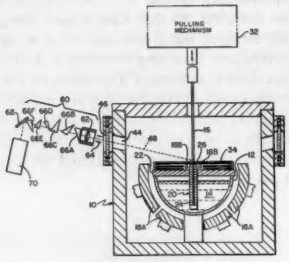
drive means operatively connected to said pump means, said drive means including an escapement mechanism which is adapted to advance said pump means through a plurality of steps to deliver said quantity of fluid to each of a plurality of test elements, each quantity of fluid being delivered by advancement of said pump means through a first step which expels a first portion of said quantity of fluid from said tip and advancement of the pump means through a second step which expels the remainder of said quantity from the tip.

4,277,441

APPARATUS FOR MONITORING CRYSTAL GROWTH

Emanual M. Sachs, Watertown, Mass., assignor to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Division of Ser. No. 3,278, Jan. 15, 1979, Pat. No. 4,242,589.
This application Mar. 17, 1980, Ser. No. 130,816
Int. Cl.³ G05D *5/00*
U.S. Cl. 422—105 **3 Claims**



1. A system for controlling the growth of a crystalline body of selected material from a growth pool of melt so that said body has a selected cross-sectional shape for some predetermined distance along its length, said growth pool being characterized by a meniscus which joins said body at said growth pool to form a solid/liquid/vapor junction, said system comprising

(1) means, including a crucible for heating said material, for establishing said growth pool,

(2) optical means for forming an image of at least the entire width of said junction and the portions of the body and meniscus above and below said junction;

(3) video display means for displaying said image, said video display means comprising

(a) means for generating a video signal representative of said image;

(b) averaging means for averaging the amplitudes of portions of the video signal representative of at least one preselected portion of said image, and

(c) means for generating an electrical signal representative of the average of said amplitudes; and

(4) means responsive to said electrical signal for controlling the growth of said body.

4,277,442

CATALYTIC EXHAUST CLEANER

P. Anders Hergart, Malmö, Sweden, assignor to Unikat AB, Malmo, Sweden

Continuation of Ser. No. 758,437, Jan. 11, 1977, abandoned. This application Nov. 16, 1979, Ser. No. 95,588
Int. Cl.³ F01N *3/10, 3/28;* **B01D** *53/34;* **B01J** *8/02*
U.S. Cl. 422—119 **3 Claims**

1. An exhaust cleaner for temporary use on a motorcar having an exhaust pipe, comprising:

(a) a container having an exhaust gas inlet and an exhaust gas outlet;

(b) a catalyst material having good heat accumulating capacity disposed within the interior of said container;

(c) electrical heating means disposed in said container in direct contact with said catalyst material;

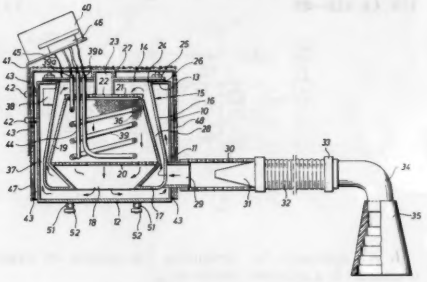
(d) means for sensing and indicating the temperature of said catalyst material;

(e) a protective enclosure at least partially surrounding said container and insulatedly spaced therefrom comprising a shield of heat insulating material and a metallic shield arranged externally of said heat insulating material;

(f) frame means mounting said container for ready transportation comprising an upstanding substantially vertical frame and a bottom frame attached to said upstanding frame and extending substantially transversely thereto, a hook-like projection extending from said frame for temporarily attaching said exhaust cleaner to a motorcar in proximity to its exhaust pipe and a handle connected to said frame for manually transporting said exhaust cleaner;

(g) a flexible hose connected to said exhaust inlet at one end and having means at the other end thereof for temporary connection to the outlet end of an exhaust pipe; and

(h) means electrically connected to said heating coil for connecting the heating coil to a power supply external to a motorcar in order to pre-heat said catalyst material to a predetermined temperature, prior to attaching said exhaust cleaner to a motorcar.

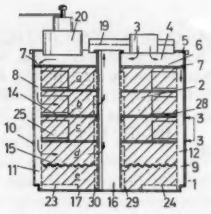


4,277,443

AIR PURIFYING CARTRIDGES FOR RESPIRATORS

Carl-Ernst Van der Smissen, Lübeck, and Gerd Pantaleon-Stemberg, Mölln, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 30, 1979, Ser. No. 89,447
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852240
Int. Cl.³ A62B *7/08;* **F01N** *3/15;* **B01J** *8/02*
U.S. Cl. 422—122 **13 Claims**



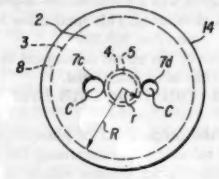
1. In combination with an expiratory air purifying cartridge for respirators of the type which contains a chemical, such as potassium peroxide, for releasing oxygen under the action of carbon dioxide and moisture, the chemical being arranged in layers separated by partitions, the layers being disposed between a perforated central tube and an air duct, so that the air traverses the layers, the improvement comprising, a basket of perforated sheet metal disposed over and spaced from the central tube adjacent at least one of the layers and a U-shaped guide element disposed on one of the partitions having a center piece spaced from the partition to define a passageway therebetween in communication with the air duct.

4,277,444

APPARATUS FOR CONVERTING HYDROCARBONS

Hugo Van Landeghem, Oytier Saint Oblas, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 29, 1979, Ser. No. 43,511
Claims priority, application France, May 29, 1978, 78 16372
Int. Cl.³ B01J 8/00, 8/12
U.S. Cl. 422—191 6 Claims



1. In an apparatus of the radial type for effecting hydrocarbon conversions in the presence of a catalyst, comprising at least one substantially vertical elongated chamber whose cross-section by a horizontal plane is circular, the elongated chamber including at least one annular enclosure provided for receiving a moving bed of catalyst and arranged substantially vertically in the elongated chamber, each annular enclosure being delimited by a permeable external cylindrical wall and a permeable internal cylindrical wall; an internal collector adjacent to each annular enclosure, formed by the internal space of each elongated chamber and delimited by the internal cylindrical wall of each annular enclosure; an external distributor adjacent to each annular enclosure and formed by the space which is delimited by the wall of each elongated chamber and by the external cylindrical wall of each annular enclosure; an inlet connected to the external distributor adjacent to each annular enclosure for feeding the reactants; an outlet connected to the internal collector adjacent to each annular enclosure for discharging the reactants; means for introducing the catalyst at the top of each annular enclosure; and at least one catalyst collector for continuously discharging catalyst from the bottom of each annular enclosure; wherein the internal wall of each annular enclosure is provided in its upper portion with a screen to impede discharge of reactants at the top of the internal collector, the screen having a height amounting to about 80–300% of the total width of each annular enclosure and being arranged as an inverted truncated cone of upwardly increasing cross-section and having the same axis as the internal cylindrical wall of each annular enclosure, the surface area of the smaller of the two bases of the truncated cone being substantially the same as that of the cross-section of the internal cylindrical wall of each annular enclosure, and the angle which the axis of the inverted truncated cone makes with one of its generators being from 10 to 40 degrees; and wherein the upper portion of the external wall of each annular enclosure amounting to about 10–40% of the height of the annular enclosure, has the shape of a truncated cone whose cross-section increases downwardly, the greater of the two bases of the truncated cone being substantially equal to the cross-section of the external cylindrical wall of the annular enclosure, and the angle which the axis of the truncated cone makes with one of its generators being from 10 to 40 degrees;

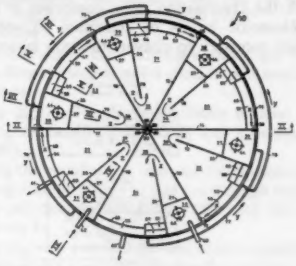
the improvement wherein each catalyst collector for continuously discharging the catalyst from the bottom of each annular enclosure is substantially cylindrical, the top of the catalyst collector being substantially flush with the bottom of the annular enclosure, and so arranged that the center of the circle that it cuts at the bottom of the annular enclosure is located at a distance less than $(R-r)/3$ from the internal wall of the annular enclosure, where R is the radius of the external wall of the annular enclosure and r is the radius of the internal wall of the annular enclosure.

4,277,445

APPARATUS FOR LIQUID-LIQUID EXTRACTION

Achille De Schepper, Lichtaart, and Antoine Van Peteghem, Olen, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Jun. 6, 1978, Ser. No. 912,989
Claims priority, application Luxembourg, Jun. 7, 1977, 77498
Int. Cl.³ B01D 11/04
U.S. Cl. 422—259 11 Claims



1. A multi-stage liquid-liquid extraction apparatus of the mixer-settler type for carrying out extractions involving light and heavy phases accompanied by a solid phase settling comprising

(a) a vessel, the essentially vertical side-walls of which define a cylinder or a regular polygonal body and the bottom of which is inclined downwardly from the side wall towards the central axis of the vessel so that the bottom resembles a reversed cone or pyramid;

(b) a pluarality of partitions dividing the vessel into a plurality of sectors, said partitions extending radially outwardly from the central axis of the vessel to said sidewall;

(c) a liquid mixing compartment located in each sector near the side-wall of the vessel, said compartment containing liquid inlet means for said light and heavy phases,

(d) an agitator in each mixing compartment in the form of a pumping turbine for mixing the phases,

(e) an outlet for each mixing compartment in the form of a weir that is located a spaced distance away from the side-wall of the vessel,

(f) a liquid outlet compartment in each sector located near the side-wall of the vessel, said compartment containing two separate outlet means for discharging two separate liquid phases from said compartment,

(g) guide means including a baffle wall in each sector extending from the outlet of the mixing chamber toward the central axis of the vessel for guiding the mixed phases from the weir of said mixing compartment towards a zone located near the central axis of the vessel and then in a nearly reverse direction outwardly towards said liquid outlet compartment, and

(h) an outlet for solids adjacent to the apex of said reversed cone or pyramid.

4,277,446

REMOVAL OF IRON AND TITANIUM MINERALS FROM ALUMINUM BEARING MATERIALS BY CHLORINATION AND BENEFICIATION

David Weston, Toronto, Canada, assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 6,111, Jan. 24, 1979, abandoned. This application Jan. 25, 1980, Ser. No. 115,397
Int. Cl.³ C01F 7/56, 7/02
U.S. Cl. 423—136 27 Claims

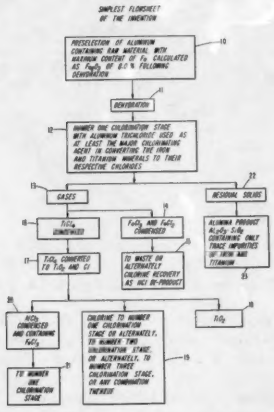
1. A process for the production of an essentially iron-free alumina product from aluminum mineral bearing materials containing at least iron minerals comprising:

(a) selecting an aluminum bearing material containing a

maximum iron content calculated as Fe_2O_3 of 8.0% following dehydration as the feed to the chlorination stage;

(b) dehydrating the said aluminum bearing material by heating in the temperature range of about 625° C. to about 1050° C.;

(c) subjecting the said dehydrated material to chlorination to differentially chlorinate at least the said contained iron minerals by reaction with at least one chlorination agent at a temperature in the range of 550° C.–1050° C. and in which the chlorination agent comprises at least a 25% stoichiometric excess of aluminum chloride over the amount necessary to convert the iron materials to their


SIMPLEST FLOWSHEET OF THE INVENTION
PRESELECTION OF ALUMINUM CONTAINING RAW MATERIAL WITH ALUMINA CONTENT OF Fe_2O_3 CALCULATED AS Fe_2O_3 OF 8.0 % FOLLOWING DEHYDRATION
10
DEHYDRATION
11
NUMBER ONE CHLORINATION STAGE WITH ALUMINUM TRICHLORIDE USED AS AT LEAST THE MAJOR CHLORINATING AGENT IN CONVERTING THE IRON AND TITANIUM MINERALS TO THEIR RESPECTIVE CHLORIDES
12
GASES
13
RESIDUAL SOLIDS
22
$TiCl_4$ CONDENSED
16
$FeCl_3$ AND $FeCl_2$ CONDENSED
ALUMINA PRODUCT $Al_2O_3 \cdot SiO_2$ CONTAINING ONLY TRACE IMPURITIES OF IRON AND TITANIUM
$FeCl_2$ CONVERTED TO $FeCl_3$ AND Cl
TO WASTE OR ALTERNATELY CHLORINE RECOVERY AS HCl BY-PRODUCT
15
$AlCl_3$ CONDENSED AND CONTAINING $FeCl_3$
CHLORINE TO NUMBER ONE CHLORINATION STAGE OR ALTERNATELY, TO NUMBER TWO CHLORINATION STAGE, OR ALTERNATELY, TO NUMBER THREE CHLORINATION STAGE, OR ANY COMBINATION THEREOF
TiO_2
TO NUMBER ONE CHLORINATION STAGE

respective chlorides, said aluminum chloride including recycle impure $AlCl_3$ from the gaseous effluent of said chlorination reaction;

(d) recovering a solids product comprising an essentially iron-free alumina product, and a gaseous effluent;

(e) subjecting the gaseous effluent from the said chlorination stage to condensation and/or fractional distillation to recover chlorides of iron and other metals, and residual aluminum chloride containing residual amounts of other products of condensation; and

(f) recycling to the chlorination stage the said residual aluminum chloride as at least a portion of the said aluminum chloride chlorinating agent.

4,277,447

PROCESS FOR REDUCING CALCIUM ION CONCENTRATIONS IN ALKALINE ALKALI METAL CHLORIDE BRINES

Richard F. Chambers, Satsuma, Ala., and Nissim Rachima, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 20, 1979, Ser. No. 67,972
Int. Cl.[3] C01F *11/18*
U.S. Cl. 423—165 **6 Claims**

1. A process for reducing calcium ion concentration in alkaline alkali metal chloride brines containing from about 0.5 to about 4.0 grams per liter of an alkali metal hydroxide which comprises admixing an alkali metal bicarbonate with said alkaline alkali metal chloride brines to form an insoluble calcium salt, said alkali metal bicarbonate being admixed in an amount sufficient to provide said alkaline alkali metal chloride brines with an excess carbonate ion concentration of from about 0.3 to about 1.0 grams per liter after said formation of said insoluble calcium salt, removing said insoluble calcium salt from said brine, and recovering a purified alkali metal chloride brine having a calcium ion concentration from about 0.5 to about 2.0 parts per million and an alkali metal hydroxide concentration of from about 0.1 to about 2.0 grams per liter.

4,277,448

PHOSPHORIC ACID PROCESS WITH HIGH CIRCULATION RATES

Fernando Ore, Whittier; John D. Ellis, Huntington Beach, and James H. Moore, La Verne, all of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 865,557, Dec. 29, 1977, Pat. No. 4,196,172, and a continuation-in-part of Ser. No. 865,556, Dec. 29, 1977, and a continuation-in-part of Ser. No. 703,208, Jul. 7, 1976, Pat. No. 4,132,760, and a continuation-in-part of Ser. No. 703,138, Jul. 7, 1976, abandoned. This application May 26, 1978, Ser. No. 909,899

The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.

Int. Cl.[3] C01F *11/46*; C01B *25/22*
U.S. Cl. 423—167 **54 Claims**

1. A process for the preparation of phosphoric acid from phosphate rock and sulfuric acid comprising the steps of:

(a) adding phosphoric acid, soluble sulfate and phosphate rock to a dissolving slurry contained in a dissolving zone, the dissolving slurry comprising calcium sulfate dihydrate, monocalcium phosphate, and phosphoric acid to substantially convert the added phosphate rock to monocalcium phosphate, phosphoric acid, and calcium sulfate dihydrate, the dissolving slurry being maintained at a soluble sulfate concentration of about −1.0 to about +1%, wherein the negative soluble sulfate concentration indicates an excess of calcium ions in the slurry and the extent to which there is an insufficient concentration of sulfate, expressed as a negative weight percent, to combine with such excess calcium ions to form calcium sulfate, and at a temperature and P_2O_5 concentration in the liquid such that calcium sulfate dihydrate is formed rather than calcium sulfate anhydrite or calcium sulfate hemihydrate;

(b) continuously removing a first portion of the dissolving slurry from the dissolving zone and continuously introducing said first portion of the dissolving slurry into a crystallization slurry contained in a crystallization zone, the crystallization slurry comprising calcium sulfate dihydrate, monocalcium phosphate, phosphoric acid and sulfuric acid, the crystallization slurry being maintained under a reduced pressure;

(c) adding sulfuric acid to the crystallization slurry to react with at least the monocalcium phosphate to form calcium sulfate dihydrate and phosphoric acid, while maintaining the crystallization slurry at a soluble sulfate concentration of from about +0.5% to about +3.0%, the soluble sulfate concentration of the crystallization slurry being greater than the soluble sulfate concentration of the dissolving slurry;

(d) continuously removing a first portion of the crystallization slurry from the crystallization zone and continuously introducing said first portion of the crystallization slurry directly into the dissolving slurry to provide at least a portion of the phosphoric acid and soluble sulfate added to the dissolving slurry in the dissolving zone;

(e) internally circulating a second portion of the dissolving slurry within the dissolving zone at a rate at least equal to 50% of the volume of the dissolving slurry per minute to better mix the dissolving slurry;

(f) internally circulating a second portion of the crystallization slurry within the crystallization zone at a rate at least equal to 50% of the volume of the crystallization slurry per minute to better mix the crystallization slurry; and

(g) withdrawing a third portion of the crystallization slurry from the crystallization zone and separating the third portion into a liquid comprising phosphoric acid and a solid comprising calcium sulfate dihydrate.

33. A process for the preparation of phosphoric acid from phosphate rock and sulfuric acid comprising the steps of:

(a) adding phosphoric acid, soluble sulfate and phosphate rock to a dissolving slurry contained in a dissolving zone, the dissolving slurry comprising solid calcium sulfate,

monocalcium phosphate, and phosphoric acid, to substantially convert the added phosphate rock into monocalcium phosphate, phosphoric acid and solid calcium sulfate;

(b) continuously removing a first portion of the dissolving slurry from the dissolving zone and continuously introducing said first portion of the dissolving slurry into a crystallization slurry contained in a crystallization zone, the crystallization slurry comprising calcium sulfate, monocalcium phosphate, phosphoric acid and sulfuric acid, the crystallization slurry being maintained at a temperature up to about 130° C.

(c) adding sulfuric acid to the crystallization slurry to react with at least the monocalcium phosphate to form solid calcium sulfate and phosphoric acid, the crystallization slurry being maintained at a soluble sulfate concentration greater than the soluble sulfate concentration of the dissolving slurry;

(d) continuously removing a first portion of the crystallization slurry from the crystallization zone and continuously introducing said first portion of the crystallization slurry directly into the dissolving slurry to provide at least a portion of the phosphoric acid and soluble sulfate added to the dissolving slurry in the dissolving zone;

(e) internally circulating a second portion of the dissolving slurry within the dissolving zone at a rate at least equal to 50% of the volume of the dissolving slurry per minute to better mix the dissolving slurry;

(f) internally circulating a second portion of the crystallization slurry within the crystallization zone at a rate at least equal to 50% of the volume of the crystallization slurry per minute to better mix the crystallization slurry; and

(g) withdrawing a third portion of the crystallization slurry from the crystallization zone and separating the withdrawn third portion of the crystallization slurry into a liquid comprising phosphoric acid and a solid comprising calcium sulfate.

34. The process according to claim **33** which includes the additional step of adding a defoamer to the dissolving slurry.

4,277,449

DRY REACTION PROCESS OF ASBESTOS TAILINGS AND AMMONIUM SULFATE

Jean-Marc Lalancette, Sherbrooke, Canada, assignor to Societe Nationale de l'Aminate, Quebec, Canada

Continuation-in-part of Ser. No. 15,435, Feb. 26, 1979, abandoned. This application May 1, 1979, Ser. No. 35,267

Int. Cl.³ C01F *5/40*

U.S. Cl. 423—167 **10 Claims**

1. In a dry process for forming magnesium sulfate by the reaction of asbestos tailings and ammonium sulfate, the improvement which comprises heating one surface only of a homogeneous dry mixture of asbestos tailings and ammonium sulfate from room temperature to a temperature within the range of 350° to 400° C., whereby until the temperature of the heated zone reaches about 250° C., the ammonium sulfate reacts with the asbestos tailings to form magnesium sulfate with evolution of gaseous ammonia, and when the temperature of the heated zone reaches at least 250° C., the ammonium sulfate decomposes to gaseous ammonia and sublimated ammonium bisulfate, allowing the latter two to progress to the intermediate zone which is at a temperature lower than 250° C., condensing the ammonium bisulfate and reacting it with the gaseous ammonia to form a new supply of ammonium sulfate which reacts with the asbestos tailings, and as the intermediate zone reaches a temperature above 250° C., the unreacted ammonium sulfate in this zone decomposes to ammonium bisulfate and ammonia, and as the latter two gases reach the outer zone of the reaction mixture condensing the ammonium bisulfate and reacting it with the ammonia to form a further supply of ammonium sulfate which reacts with the asbestos tailings, and continuing to heat the first heating zone until the temperature of the zone furthest away from the heating zone reaches a temperature of between 250° and 300° C., and recovering the magnesium sulfate from the reaction mixture.

4,277,450

REMOVAL OF SULFUR DIOXIDE FROM GAS

Louis R. Dilworth, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 21,026, Mar. 16, 1979, Pat. No. 4,226,831. This application Dec. 10, 1979, Ser. No. 101,479

Int. Cl.³ B01J *8/00;* **C01B** *17/00*

U.S. Cl. 423—244 **10 Claims**

1. A method of scrubbing a flowing emission gas to remove therefrom pollutant gaseous sulfur dioxide said method being characterized by:

(a) feeding (e.g. at **7**) a fresh dry finely divided pollutant adsorbing medium (e.g. from **13**) into a defined mixing zone (**107**);

(b) injecting the emission gas into said mixing zone (**107**) and producing turbulent flow of said gas through said zone (as by **6**) to mix the emission gas (in **107**) with the fresh medium (from **7**);

(c) conducting said emission gas and admixed medium away from said mixing zone (**107**) along a defined first path (**107, 5, 8**) to a location at which said medium and pollutant adsorbed by said medium is separated from said emission gas (e.g. at **10**);

(d) recirculating a major portion of the separated medium (from **10**) along a second path (**10, 16, 17**) back to said mixing zone (**107**) to provide a closed loop recirculation path (**107, 5, 8, 10, 16, 17, 107**) for recirculating medium;

(e) removing a minor portion of said medium (e.g. at **34**) from the recirculation path while continuing to circulate said major portion around the recirculation path (**107, 5, 8, 10, 16, 17, 107**);

(f) controlling the rate of removal of medium (as by **35**) from the recirculation path (at **34**) and the rate medium is injected (at **7**) to said mixing zone (**107**) to remove and replace a minor portion of the circulating medium and to deliver medium to said mixing zone (**107**) comprising recircultated medium (from **17**) plus fresh medium (from **13**), in amounts that together total at least about nine times that required for stoichiometric adsorbtive chemical reaction between said medium and the pollutant present in the emission gas;

(g) heating said medium out of contact with the emission gas (at **12** or **15**) prior to feeding said medium into said mixing zone (**107**); and

(h) controlling said heating of said medium (by e.g. **26, 28** at **12** and/or **35, 38** at **15**) to admit said medium to mixing zone **107** at a temperature high enough for adsorbtive chemical reaction between said medium and said pollutant gas.

4,277,451

WET PROCESS FOR THE DESULFURIZATION OF EXHAUST GAS

Ataru Wakabayashi, Yokohama, and Isao Masuhara, Kawasaki, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Dec. 13, 1979, Ser. No. 103,175

Claims priority, application Japan, Dec. 20, 1978, 53-156255

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—243 **11 Claims**

1. A cyclic wet process for desulfurization of exhaust gas which contains sulfur dioxide, which comprises the following operation steps to remove and recover sulfur dioxide from said exhaust gas:

(A) contacting exhaust gas with an absorbent comprising potassium salts of tartaric acid having a pH of 4.5–6.5 to absorb sulfur dioxide from said exhaust gas at a temperature below about 80° C. at which potassium hydrogentartrate is formed and precipitates as a solid,

(B) removing a portion of the absorbent from step (A) which contains the absorbed sulfur dioxide and heating it to liberate and recover sulfur dioxide therefrom, and

(C) cooling the absorbent from the step (B) from which the sulfur dioxide has been removed to a temperature suitable for the absorption of sulfur dioxide from the exhaust gas and recycling it to the step (A).

4,277,452

CARBON MONOXIDE ABSORBING LIQUID

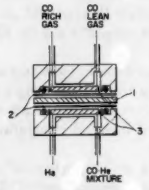
Keiichi Kanehori, Hachioji; Shinkichi Horigome, Tachikawa; Masayuki Katsumoto, Kodaira, and Yoshijiro Arikawa, Kure, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 8, 1980, Ser. No. 110,558

Claims priority, application Japan, Jan. 12, 1979, 54-1350

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—246 **6 Claims**



6. A method of removing carbon monoxide from a gaseous mixture containing carbon monoxide in a concentration of at least about 5% by volume which comprises treating said gaseous mixture with an absorbing liquid containing cuprous ions in a concentration of about 0.1 to 6 moles/l, hydrochloric acid in a concentration of about 0.5 to 7 moles/l, and titanium trichloride in a concentration of at least about 1/10 of the concentration of the cuprous ions.

4,277,453

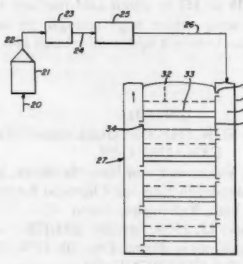
WASTE GAS PURIFICATION REACTOR AND METHOD

John E. Aiken, Monroeville Boro, and William J. Didycz, Whitehall Boro, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 4, 1979, Ser. No. 44,895

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—247 **12 Claims**



1. Process for removing oxidizable pollutants from a waste gas stream comprising:

(1) removing dissolved organic acids from liquid droplets entrained in said waste gas stream by (a) heating said droplets to evaporate the liquid of said droplet and (b) contacting said waste gas stream with means for collecting said dissolved organic acids upon evaporation of the liquid of said droplets,

(2) introducing said waste gas stream having said dissolved organic acids removed, through an inlet into a chamber containing a catalyst bed for oxidizing said pollutants,

(3) passing said waste gas stream through a distributor plate containing a multiplicity of holes located between said inlet and said catalyst bed in a manner such that said waste gas is substantially uniformly distributed over said catalyst bed,

(4) passing said waste gas through said catalyst bed while maintaining said catalyst bed at a temperature sufficient to sustain catalytic oxidation of said oxidizable pollutants, and

(5) withdrawing through an outlet of said chamber said waste gas stream which has passed through said catalyst bed.

4,277,454

METHODS FOR THE CONTROL OF EXCESSIVE CORROSION IN PHOSPHORIC ACID CIRCUITS

Gary L. Long, and Roger B. Humberger, both of Pocatello, Id., assignors to J. R. Simplot Company, Pocatello, Id.

Filed Sep. 18, 1979, Ser. No. 76,574

Int. Cl.³ C01B *25/225, 25/226;* **C23F** *11/04*

U.S. Cl. 423—320 **17 Claims**

1. A method for control of excessive corrosion in phosphoric acid circuits by oxidation of reduced ion species in phosphoric acid, the method comprising the steps of:

(a) flowing phosphoric acid slurry to be treated in a phosphoric acid plant digestion system operating by a dihydrate process; said digestion system including at least one digester, at least one filter, and at least one evaporator;

(b) flowing and producing the phosphoric acid slurry in said primary digester of said dihydrate digestion system and maintaining said acid slurry in said digester at a temperature between about 165° F. to about 185° F. for a sufficient period of time to effect primary digestion of the phosphoric acid slurry;

(c) flowing said acid slurry from said digester to said filter of said digestion system and maintaining said acid slurry on said filter at a temperature of between about 165° F. to about 174° F. for a sufficient period of time to effect filtration of the phosphoric acid slurry;

(d) flowing said acid from said filter to said evaporator of said digestion system and maintaining said acid in said evaporator at a temperature between about 160° F. to about 185° F.; and

(e) maintaining the EMF of said acid slurry throughout the digestion system at a value of at least 190 millivolts (S.C.E.) by use of an oxidant.

10. A method for control of excessive corrosion in phosphoric acid circuits by oxidation of reduced ion species in phosphoric acid, the method comprising the steps of:

(a) flowing phosphoric acid slurry to be treated in a phosphoric acid plant digestion system operating by a hemihydrate process; said digestion system including at least one digester, at least one filter, and at least one evaporator;

(b) flowing and producing the phosphoric acid slurry to said primary digester of said hemihydrate digestion system and maintaining said acid slurry in said digester at a temperature between about 160° F. to about 205° F. for a sufficient period of time to effect primary digestion of the phosphoric acid slurry;

(c) flowing said acid slurry from said digester to said filter of said digestion system and maintaining said acid slurry on said filter at a temperature of between about 160° F. and about 180° F. for a sufficient period of time to effect filtration of the phosphoric acid slurry; and

(e) maintaining EMF of said acid slurry throughout the digestion system at a value of at least 190 millivolts (S.C.E.) by use of an oxidant.

4,277,455

PROCESS FOR PURIFYING PHOSPHORIC ACID

Thomas A. Williams, Beckermet, and Frank M. Cussons, Little Broughton, both of England, assignors to Albright & Wilson Limited, Warley, England

Filed Oct. 12, 1979, Ser. No. 84,188

Claims priority, application United Kingdom, Oct. 16, 1978, 40622/78

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 S 15 Claims

1. In a process for purifying feed wet process phosphoric acid prepared from contact of phosphate rock and sulphuric acid which comprises treating the feed wet process acid with a ketone solvent which is a dialkyl ketone of 5 or 6 carbon atoms to form a crude ketone extract containing at least some of the acid in the feed acid, purifying said crude ketone extract, and then releasing the acid in the purified extract to form aqeous purified phosphoric acid, the improvement which comprises scrubbing said crude ketone extract with water or purified phosphoric acid scrub liquor to produce a scrubbed purified extract, and a used aqueous acid scrub liquor which is all recycled to said contact of wet process phosphoric acid and a ketone, and then contacting said scrubbed purified extract with water or phosphoric acid in a single stage to give a first aqueous product purified phosphoric acid and an acid laden ketone layer which are separated, and then contacting said acid laden ketone layer with water in more than one countercurrent stage to form a second aqueous product purified phosphoric acid and a ketone layer, which are separated, each of the first and second product purified acids containing 35–65% of the phosphoric acid in the scrubbed, purified extract.

4,277,456

MINERAL SUBSTANCE BASED ON A REVERSIBLY SWELLABLE TRI-LAMINAR MINERAL DEVELOPED TO BE CRYSTALLINE OVER A LARGE AREA AND HAVING CRYSTAL LAYERS SEPARATED FROM ONE ANOTHER

Ralf Dabrowski, Hilden, Fed. Rep. of Germany, assignor to Firma Hans Kramer GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 18, 1978, Ser. No. 925,780

Int. Cl.³ B32B *19/00;* C01B *33/22*

U.S. Cl. 423—328 14 Claims

1. A reversibly swellable tri-laminar mineral which is crystalline over a large area and in which the crystal layers are separated from one another, said tri-laminar mineral containing more than about 50 percent by weight of tabular particles, said particles having a thickness of from about 0.5 to about 10 microns, an equivalent diameter of from about 10 to about 200 microns, a ratio of particle thickness to equivalent diameter equal to or smaller than about 1:10, said particles possessing hydrophilic properties on the planar surfaces thereof permitting the particles to quickly take up or give off water, and upon taking up water, the particles swell, and upon giving off water, the particles shrink, in a single direction which is perpendicular to the tabular plane of the particles, it being further provided that said particles are disposed substantially side by side in flat layers and with extensive plasticity in the range of from about 35 to about 65 percent, said tri-laminar material having a plasticity factor h_1 of from about $65.4393 - 1.32126.W + 1.03456.10^{-2}W^2 - 2.80579.10^{-5}W^3$ in the limits of from about 60 to about 140 W with h_1 representing mm. on the Bowmaker scale and W representing g H_2O/100 g of dry substance.

4,277,457

ALKALI CALCIUM SILICATES AND PROCESS FOR PREPARATION THEREOF

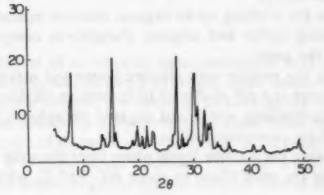
Genji Taga, Shinnanyo; Teruo Oikawa, Kudamatsu, and Yoshiaki Watanabe, Hikari, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Jul. 5, 1979, Ser. No. 54,810

Claims priority, application Japan, Jul. 7, 1978, 53/81935; Jul. 11, 1978, 53/83565; Aug. 7, 1978, 53/95397; Sep. 21, 1978, 53/115131; Dec. 5, 1978, 53/158639

Int. Cl.³ C01B *33/24*

U.S. Cl. 423—331 29 Claims



1. An alkali calcium silicate having an X-ray diffraction pattern having diffraction peaks at spacings (d) of 11.8–12.2 Å, 6 Å and 3 Å.

12. A process for the preparation of alkali calcium silicates according to claim **10**, wherein the silicon dioxide component is a hardly soluble silicon dioxide component and the hydrothermal reaction is carried out at a temperature of 150° to 250° C. under conditions satisfying any one of requirements defined by the following formula combinations (I), (J) and (K):

$$\left.\begin{array}{l} 1.2 \leqq T \leqq 0.006t + 0.15 \\ U \leqq 0.01 \end{array}\right\} \quad \text{(I)}$$

$$\left.\begin{array}{l} 0.006t + 0.15 < T \leqq 0.008t + 0.6 \\ 0.002 \leqq U \leqq 0.00008t - 0.008 \end{array}\right\} \quad \text{(J)}$$

$$\left.\begin{array}{l} 0.008t + 0.6 < T \leqq 3.0 \\ 0.002 \leqq U \leqq 0.04 \end{array}\right\} \quad \text{(K)}$$

wherein

T stands for said starting material charge coefficient, U stands for said alkalinity coefficient and t stands for the hydrothermal reaction temperature (° C.),

whereby an alkali calcium silicate of the type 12 A is formed.

4,277,458

PROCESS FOR OXIDIZING SULFUR AND SULFUR COMPOUNDS

Andre Sugier, Rueil; Philippe Courty, Houilles; Andre Deschamps, Noisy le Roi, and Henri Gruhier, Chatillon, Bagneux, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 13, 1979, Ser. No. 57,464

Claims priority, application France, Jul. 13, 1978, 78 21345

Int. Cl.³ C01B *31/20, 17/50;* B01D *53/34*

U.S. Cl. 423—437 14 Claims

1. A catalytic process for directly converting any carbon oxysulfide and carbon disulfide in a gas containing at least one of the same to carbon dioxide and sulfur dioxide in a single step, which process comprises contacting a gas containing oxygen and at least one of carbon oxysulfide and carbon disulfide with a substantially iron-free catalyst comprising a carrier, vanadium oxide and silver.

4,277,459

PROCESS FOR WORKING UP ORGANIC REACTION MIXTURES

Otto Berendes, Dormagen, Fed. Rep. of Germany, and Karl-Heinz Vopel, Leawood, Kans., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 3,432, Jan. 12, 1979, which is a continuation of Ser. No. 883,758, Mar. 6, 1977, abandoned, which is a continuation of Ser. No. 785,276, Apr. 6, 1977. This application Feb. 13, 1980, Ser. No. 121,210

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617812

Int. Cl.[3] **C01B** *17/033*

U.S. Cl. 423—567 A **5 Claims**

1. Process for working up an organic reaction mixture residue containing sulfur and organic phosphorus compounds, comprising the steps:

(a) mixing the residue with alkaline water and maintaining the mixture at a pH of at least 10 to form an alkaline liquid phase comprising water and organic phosphates, and a solid phase comprising sulfur;

(b) separating the alkaline liquid phase from the solid phase;

(c) heating the solid phase to about 60°-100° C. while stirring;

(d) Mixing the solid phase with the alkaline liquid phase and sufficient nitric acid to form an acidic reaction mixture with the pH maintained below 3;

(e) heating the acidic reaction mixture to form, simultaneously, purified crystalline sulfur and a liquid suitable as a fertilizer; and

(f) separating the purified crystalline sulfur from the liquid.

4. Process as claimed in claim **1** wherein the acidic reaction mixture is at a pH of about 1.

4,277,460

CORTISOL RADIOIMMUNOASSAY METHOD AND CORTISOL DERIVATIVES USEFUL THEREFOR

Masaharu Kojima; Hisao Sone, both of Fukuoka; Hiroshi Ogawa, Kashiwa; Nobuhiko Nakazawa, Urawa, and Seiji Tachibana, Tokyo, all of Japan, assignors to Daiichi Radioisotope Laboratories, Ltd., Tokyo, Japan

Division of Ser. No. 802,397, Jun. 1, 1977, Pat. No. 4,190,593. This application Aug. 22, 1979, Ser. No. 68,834

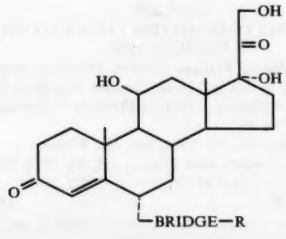
Claims priority, application Japan, Jun. 1, 1976, 51-63985

Int. Cl.[3] **G01N** *33/48;* **A61K** *43/00;* **G01T** *1/00*

U.S. Cl. 424—1 **4 Claims**

1. A radioimmunoassay method for determining cortisol which comprises

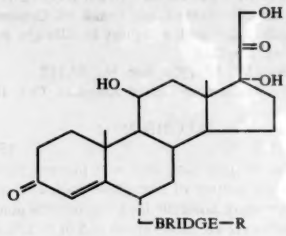
(a) immunologically producing an antibody to cortisol (C) by injecting a cortisol-carrier conjugate having the formula (C)



(C)

wherein R represents a protein or a polypeptide, and Bridge is —SCH_2CO— or —$OCOCH_2CH_2CO$—; into a host organism and producing said antibody;

(b) adding said antibody obtained in (a) and a radioactive cortisol tracer compound of the formula (D)



(D)

wherein R respresents a radioiodinated tyrosine lower alkyl ester residue, a radioiodinated tyramine residue, a radioiodinated histamine residue, or a radioiodinated 7-aminoheptanoyltyrosine lower alkyl residue, and Bridge is —SCH_2CO— or —$OCOCH_2CH_2CO$—; to a sample containing cortisol;

(c) incubating said mixture obtained in (b);

(d) separating antibody bound tracer compound formed in (c) from free tracer compound; and

(e) measuring the radioactivity of said antibody bound or free tracer compound; with the proviso that said Bridge in said cortisol-carrier conjugate is different from said Bridge in said radioactive cortisol tracer compound.

4,277,461

VAGINAL CONTRACEPTIVE

Peter W. Lücker, Am Rebstöckel 13, D-6719 Bobenheim am Berg, and Nikolaus Wetzelsberger, Dürerstrasse 12, D-6700 Ludwigshafen am Rhein, both of Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,622

Claims priority, application Switzerland, Dec. 22, 1978, 13146/78

Int. Cl.[3] **A61K** *31/16*

U.S. Cl. 424—44 **14 Claims**

1. A contraceptive for vaginal use, consisting essentially of a spermicidal active substance of the formula

$$RCONH—(CH_2CH_2O)_n—H$$

in which R denotes an alkyl or alkenyl radical having from 5 to 19 carbon atoms and n has a value of from 3 to 20, in an amount which is adequate for reliable contraception, a foam generator consisting of a mixture of an alkali metal bicarbonate and a water-soluble, solid, anhydrous acid selected from the group consisting of mono- and poly-carboxylic acids having from 2 to 6 carbon atoms, in a stoichiometric ratio, in an amount which just suffices to produce foam, and a water-soluble excipient selected from the group consisting of polyethylene glycols and mixtures of polyethylene glycols, which melts at body temperature.

4,277,462

METHOD FOR TREATING DUTCH ELM DISEASE USING *P. SYRINGAE*

Gary A. Strobel, Bozeman, Mont., assignor to Endowment and Research Foundation at Montana State University, Bozeman, Mont.

Filed Nov. 19, 1979, Ser. No. 95,448

Int. Cl.[3] **A01N** *63/00, 63/02*

U.S. Cl. 424—93 **19 Claims**

1. A method of treating Dutch elm disease comprising applying a Dutch elm disease-controlling amount of *P. syringae* NRRL B-12050 to an elm tree.

12. A method of treating Dutch elm disease comprising applying an antimycotic substance-forming strain of *P. syringae* to an elm tree in a Dutch elm disease-controlling amount; said antimycotic substance being that produced by cultivating *P. syringae* NRRL B-12050 in suitable aqueous nutrient medium

and isolating said antimycotic substance therefrom by extracting with n-butanol.

4,277,463

REMEDY PRODUCING HEMOSTATIC AND ANTIPHLOGISTIC EFFECTS

Dobrivoje Tomic, 64 McLean St., Wellesly Hills, Mass. 02181

Filed Aug. 1, 1979, Ser. No. 62,802

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834320

Int. Cl.³ A61K *33/42*

U.S. Cl. 424—128 **2 Claims**

1. A medicinal composition for use in the topical treatment of wounds and inflammation of the skin and mucous membrane, comprising a pharmaceutically effective mixture of the following ingredients in the following approximate percentage amounts for a 1000 ml preparation thereof,

NaCl: 0.7
KCl: 0.02
$Na_2HPO_4.12H_2O$: 0.6
$MgCL_2.6H_2O$: 0.02
$Ca_3(PO_4)2$: 6.0
Pectin: 6.0
Glycerin: 12.0
MgO: 0.2
H_2O: add 1000 ml

said composition adapted to produce hemostatic and antiphlogistic effects when applied to the treated area.

4,277,464

PREVENTING TOOTH DEMINERALIZATION USING ASPARTAME

George H. Reussner, and Reinhardt Thiessen, Jr, both of Pearl River, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 614,995, Sep. 19, 1975, abandoned. This application Mar. 28, 1979, Ser. No. 24,810

Int. Cl.³ A61K *37/00, 7/16;* A23L *1/236;* A23J *1/00*

U.S. Cl. 424—177 **7 Claims**

1. A method of reducing the demineralization of tooth enamel caused by contacting said enamel with an acid-containing food product which normally fosters tooth enamel demineralization comprising the step of adding to said food product, aspartame in an amount that produces excess sweetness and a sweetness modulating material.

4,277,465

ADJUVANT FOR PROMOTING ABSORPTION OF THERAPEUTICALLY ACTIVE SUBSTANCES THROUGH THE DIGESTIVE TRACT

Akira Kamada, Suita, Japan, assignor to Kyoto Yakuhin Kogyo Kabushiki Kaisha, Kyoto and Sawai Seiyaku Kabushiki Kaisha, Osaka, both of, Japan

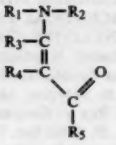
Filed Aug. 17, 1979, Ser. No. 67,451

Claims priority, application Japan, Aug. 26, 1978, 53-104130; Jul. 30, 1979, 54-97931

Int. Cl.³ A61K *37/26*

U.S. Cl. 424—178 **13 Claims**

1. A pharmaceutical composition for absorption through the digestive tract, which comprises a therapeutically effective amount of insulin and an absorption promoting amount of an enamine derivative of the formula



wherein

is the residue of an organic aminocarboxylic acid or organic aminosulfonic acid having a hydrogen atom removed from the amino group thereof, the carboxyl or sulfo group in said residue being optionally in the form of an alkali metal salt or ester; wherein one of R_1 and R_2 is a carboxy or sulfo substituted alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or naphthyl group and the other of R_1 and R_2 is hydrogen, lower alkyl or phenyl, R_3 is a hydrogen atom, a lower group or a lower alkoxy group, R_4 is a hydrogen atom, a lower alkyl group or a lower alkoxycarbonyl group, R_5 is a lower alkyl group, a lower alkoxy group which may optionally be substituted by hydroxyl, carboxyl or lower alkoxycarbonyl, or a lower alkylamino group which is substituted by hydroxyl, carboxyl or lower alkoxycarbonyl.

4,277,466

COMPLEXES OF DNA AND ESTERS DERIVED FROM DAUNORUBICINE, THEIR PREPARATION AND USE

Andre Trouet, Winksele, Belgium, assignor to Institut International de Pathologie Cellulaire et Moleculaire, Brussels, Belgium

Filed Aug. 17, 1979, Ser. No. 67,511

Claims priority, application Belgium, Aug. 29, 1978, 870026

Int. Cl.³ A61K *31/71;* C07H *15/24*

U.S. Cl. 424—180 **5 Claims**

1. An antitumoral complex of DNA and 14-diethoxyacetoxy daunorubicin.

5. Pharmaceutical composition which contains a pharmaceutically effective amount of a complex as defined in claim 1 in lyophilized (freeze-dried) form or in solution in a pharmaceutically acceptable diluent or solute.

4,277,467

ENDOPARASITICIDAL PASTES FOR HORSES

Hubert Dorn, Wuppertal, and Herbert Voege, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 74,043

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841882

Int. Cl.³ A61K *31/66*

U.S. Cl. 424—217 **8 Claims**

1. An endoparasiticidal paste for horses, which comprises a mixture of 2,2,2-trichloro-1-hydroxyethylphosphonic acid dimethyl ester and N-(2-methoxyacetamido-4-phenylthiophenyl)-N′,N″-bis-methoxy-carbonylguanidine and a water content of less than one percent by weight, relative to the total composition of the endoparasiticidal paste.

4,277,468

11-METHYLENE STEROIDS, THEIR PREPARATION AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Helmut Hofmeister; Rudolf Wiechert; Klaus Annen; Henry Laurent, and Hermann Steinbeck, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

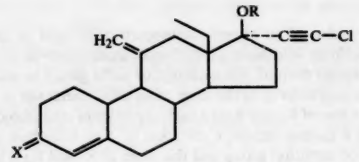
Filed Mar. 28, 1980, Ser. No. 135,066

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2913381

Int. Cl.[3] C07J *1/00*

U.S. Cl. 424—243 10 Claims

1. An 11-methylene steroid of the formula



wherein

R is hydrogen or the acyl residue of a hydrocarbon C_{1-17} carboxylic or sulfonic acid, and

X is oxygen or two hydrogen atoms.

4,277,469

HETEROCYCLIC TRIAZOLE COMPOUNDS, PROCESSES FOR THEIR PREPARATION, PESTICIDAL COMPOSITIONS CONTAINING THEM, AND METHODS OF COMBATING PESTS

Paul A. Worthington, Maidenhead; William G. Rathmell, and Anthony M. Skidmore, both of Wokingham, all of England, assignors to Imperial Chemical Industries Limited, London, England

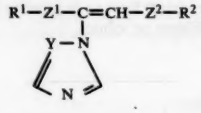
Filed Jul. 18, 1979, Ser. No. 58,445

Claims priority, application United Kingdom, Jul. 27, 1978, 31318/78

Int. Cl.[3] A01N *43/64;* C07D *233/58, 249/08, 233/60*

U.S. Cl. 424—245 8 Claims

1. A triazole compound having the formula



wherein each of R^1 and R^2, which may be the same or different, is straight or branched chain alkyl having from 1 to 5 carbon atoms optionally substituted with 1 to 3 halogen atoms; cycloalkyl having from 3 to 6 carbon atoms; or phenyl optionally substituted with one or more halogen atoms or C_{1-4} alkyl, halo C_{1-4} alkyl, hydroxy C_{1-4} alkyl, phenyl, halophenyl, nitro, cyano or C_{1-4} alkoxy,

Y is =N— and

one of Z^1 and Z^2 is —C=O and the other is —CH(OH)—; and the alkanoate esters, alkyl, aryl or aralkyl ethers, acid addition salts and copper, zinc, manganese or iron complexes thereof.

7. A composition for combating fungi comprising, as an active ingredient, an effective amount of a compound as claimed in claim 1; together with a carrier or diluent for the active ingredient.

4,277,470

HETEROCYCLIC SPIRO-LINKED AMIDINES, COMPOSITIONS AND USE THEREOF

Manfred Försch, Nauheim; Wolfgang Schaub, Kelkheim, and Hermann Gerhards, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

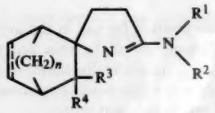
Filed Feb. 21, 1980, Ser. No. 123,200

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907070

Int. Cl.[3] A61K *31/40, 31/54;* C07D *207/22, 295/00*

U.S. Cl. 424—246 10 Claims

1. Heterocyclic, spiro-linked amidines of the formula I



I

in which (a) n is 1 or 2; (b) R^1 and R^2 are hydrogen or alkyl radicals which, together with the nitrogen atom, can form a 5-, 6- or 7-membered ring which can be substituted by C_1–C_3-alkyl, C_1–C_2-alkoxy, hydroxyl or C_1–C_4-alkoxycarbonyl groups and in which one of the carbon atoms can also be replaced by an oxygen, sulfur or nitrogen atom, it being possible for the nitrogen atom to be substituted by hydrogen, by the formyl group or by a phenyl radical, which can in turn be monosubstituted or polysubstituted by a C_1 to C_4-alkyl group or an alkoxy, methylenedioxy, hydroxyl, halogen, nitro or amino group, or it being possible for the nitrogen atom to be substituted by a C_1–C_4-alkyl group, or in which R^1 represents hydrogen and R^2 represents a C_5–C_8-cycloalkyl radical which can be substituted by C_1–C_4-dialkylamino groups; (c) R^3 is hydrogen or methyl and (d) R^4 denotes a phenyl radical which is optionally monosubstituted or polysubstituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, methylenedioxy, hydroxyl, halogen, cyano, nitro, trifluoromethyl, amino, C_2–C_5-acylamino or mono- or di-C_1–C_4-alkylamino groups, or a thiophene radical, and the physiologically acceptable salts of compounds of the formula I.

9. Antidepressant composition comprising an effective amount of a compound as defined in claim 1 and a physiologically acceptable auxiliary agent or carrier therefor.

4,277,471

1,1-BIPHENYL-2-YL ALKYLAMINES, FORMULATIONS AND ANTIARRHYTHMIC TREATMENT

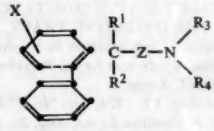
William B. Lacefield, Indianapolis, and Richard L. Simon, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 19,534, Mar. 12, 1979, abandoned. This application Feb. 22, 1980, Ser. No. 123,855

Int. Cl.[3] A61K *31/135, 31/275, 31/535;* C07C *87/28*

U.S. Cl. 424—248.4 45 Claims

1. A compound of the formula



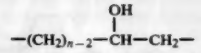
wherein:

X is hydrogen or halo;

R^1 is hydrogen, hydroxy, C≡N, $CONH_2$ or $COOR^5$, where R^5 is hydrogen or lower alkyl;

R^2 is hydrogen or C_1–C_3 alkyl;

Z is $—(CH_2)_n—$, or



where n is 2, 3 or 4;

R^3 and R^4 independently are hydrogen, lower alkyl, lower alkenyl, phenyl alkyl, or taken together with the nitrogen to which they are attached form a cyclic ring selected from pyrrolidino, piperidino, and morpholino, and the pharmaceutically acceptable acid addition salts and quaternary ammonium salts thereof.

41. A method of treating cardiac arrhythmias comprising administering an antiarrhythmically effective amount of a compound of claim **1** to a subject suffering from an arrhythmia and in need of treatment or to a subject suspected of developing an arrhythmia.

4,277,472

3,6-DISUBSTITUTED-5,7-(LOWER ALKANO)-5,6,7,8-TETRAHYDROPYRIDO(4,3-C)PYRIDAZINES; THEIR INTERMEDIATES, PREPARATION, ANTIHYPERTENSIVE USE AND COMPOSITIONS

Hermann Amschler, Radolfzell, Fed. Rep. of Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Fed. Rep. of Germany

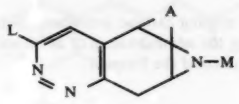
Filed Oct. 26, 1979, Ser. No. 88,469

Claims priority, application Switzerland, Nov. 10, 1978, 11585/78

Int. Cl.[3] **C07D** *451/14, 471/18;* **A61K** *31/50*

U.S. Cl. 424—248.5 **29 Claims**

1. A substituted pyridazine of the formula



(II)

wherein

A is lower alkylene;

L is —NH—R^1 or Z;

M is —H or —C(=X)R^2;

R^1 is —NHR^3, —N(R^4)R^5 or —N=C(R^8)R^9;

R^2 is lower alkyl, phen(lower)alkyl, lower alkoxy, lower alkylmercapto, optionally-substituted aryl, phen(lower)alkoxy or —N(R^6)R^7;

R^3 is —H, lower alkanoyl, lower alkoxycarbonyl, mono(lower alkyl)carbamoyl or di(lower alkyl)carbamoyl;

R^4 and R^5 are, independently, lower alkyl or phen(lower)alkyl;

R^6 and R^7 are, independently, —H, lower alkyl, phen(lower)alkyl, optionally-substituted aryl or, taken together and with the nitrogen atom to which both are bound, piperidino, morpholino, piperazino or 4-(lower alkyl)-piperazino;

R^8 is —H, lower alkyl, phen(lower)alkyl, optionally-substituted aryl or, together with R^9, alkylene having from 4 to 11 carbon atoms;

R^9 is lower alkyl, phen(lower)alkyl, lower alkenyl, optionally-substituted aryl or, together with R^8, alkylene having from 4 to 11 carbon atoms;

X is an oxygen atom or a sulfur atom, and

Z is halo, lower alkoxy or lower alkylmercapto; or an acid-addition salt thereof which is soluble in some solvent;

each aryl having from 6 to 10 ring-carbon atoms;

any substituted aryl being substituted with at most 2 substituents selected from the group consisting of halo, lower alkyl, phen(lower)alkyl, lower alkoxy, lower alkylmercapto, trifluoromethyl or nitro and

each "lower" meaning "with from 1 to 5 carbon atoms".

5. A substituted pyridazine according to claim **1** wherein L is —NH—R^1 and M is —C(=X)—R^2, or an acid-addition salt thereof.

28. An antihypertensive medicament composition comprising carrier and an effective amount of a physiologically-acceptable antihypertensive substituted pyridazine according to claim **5**.

4,277,473

4-HOMOISOTWISTANE-AMINOACID AMIDES

Yoshiaki Inamoto, Utsunomiya; Motoyoshi Osugi, and Eiji Kashihara, both of Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo and Sumitomo Chemical Industries Ltd., Osaka, both of, Japan

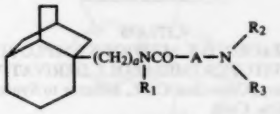
Filed Dec. 12, 1979, Ser. No. 102,702

Claims priority, application Japan, Dec. 21, 1978, 53-159540

Int. Cl.[3] **C07C** *103/50, 103/68;* **A61K** *31/16*

U.S. Cl. 424—248.54 **9 Claims**

1. A compound having the formula



(I)

wherein a is 0 or 1, R_1 is hydrogen or lower alkyl, A is lower alkylene or lower alkylidene, and R_2 and R_3, which can be the same or different, are hydrogen, lower alkyl, cycloalkyl, benzyl, benzyl substituted on the ring with alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 3 carbon atoms, chloro, bromo or nitro, or

forms a saturated heterocyclic ring selected from the group consisting of pyrrolidine, piperidine and morpholine, and pharmacologically acceptable acid addition salts thereof.

4,277,474

TREATMENT OF ALLERGIC SYMPTOMS WITH PROPANONE DERIVATIVES

Akihide Kohda, Gifu, and Teikichi Kurosaki, Osaka, both of Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

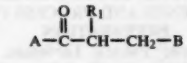
Continuation-in-part of Ser. No. 13,887, Feb. 22, 1979, abandoned. This application Sep. 27, 1979, Ser. No. 79,460

Claims priority, application Japan, Feb. 22, 1978, 53-19303

Int. Cl.[3] **A61K** *31/535, 31/445*

U.S. Cl. 424—248.57 **9 Claims**

1. A method for alleviating the appearance of various allergic symptoms in the human body which comprises administering to the human body an effective amount of a composition comprising a carrier and a compound of the formula:



in which:

(a) when R_1 is hydrogen;

A is β-naphthyl; naphthyl substituted by methoxy; or phenyl substituted by two to five alkyls having each one to four carbon atoms; and

B is piperidino;

(b) when R_1 is alkyl having one to two carbon atoms;

A is indanyl; tetrahydronaphthyl; naphthyl; naphthyl substi-

tuted by halogen, hydroxy, alkyl having one to four carbon atoms or alkoxy having one to four carbon atoms; phenyl substituted by alkyl having one to ten carbon atoms, alkoxy having one to four carbon atoms or phenyl; phenyl substituted by two to five alkyls having each one to four carbon atoms; phenyl substituted by two to five alkoxys having each one to four carbon atoms; phenyl substituted by alkoxy having one to four carbon atoms and halogen or hydroxy; or phenyl substituted by two halogens; and

B is dialkylamino having each one to four carbon atoms; pyrrolidino; morpholino; piperidino; piperidino substituted by alkyl having one to four carbon atoms or benzyl; or piperazino substituted by alkyl having one to four carbon atoms or benzyl

provided that;

when A is phenyl substituted by one alkyl having one to three carbon atoms or methoxy,

B is the said group other than piperidino; or a pharmaceutically acceptable salt thereof.

4,277,475

CONTRACEPTIVE METHODS EMPLOYING 1-SUBSTITUTED IMIDAZOLE DERIVATIVES

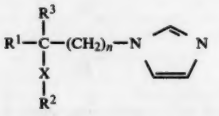
Brian H. Vickery, Cupertino, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 11, 1979, Ser. No. 2,638

Int. Cl.³ A61K *31/415, 31/495*

U.S. Cl. 424—250 **19 Claims**

1. A method of contraception in a male mammal comprising administering to a subject clinically asymptomatic of microbial infection, prior to coitus, a spermatostatically effective amount of a 1-substituted imidazole of the formula



wherein R^1 and R^2 are each independently alkyl (1–12), alkenyl (1–12), substituted or unsubstituted phenyl, substituted or unsubstituted phenyl lower alkyl (1–4), or substituted or unsubstituted phenyl lower alkenyl (1–4), wherein substituted with reference to phenyl refers to phenyl substituted by one or more lower alkyl (1–4), halo, lower alkoxy (1–4), trifluoromethyl, nitro or cyano groups; R^3 is hydrogen or lower alkyl (1–4); X is oxygen or sulfur; n is an integer of from 1 to 4; or a pharmaceutically acceptable acid addition salt thereof.

16. A method of contraception in a male mammal comprising administering to a subject clinically asymptomatic of microbial, infection prior to coitus, a spermatostatically effective amount of 1-acetyl-4-[4-[2-(2,4-dichlorophenyl)-2-(1H-imidazol-1-ylmethyl)-1,3-dioxolan-4-ylmethyoxy]-phenyl]piperazine or a pharmaceutically acceptable acid addition salt thereof.

4,277,476

DERIVATIVES OF FLUORENES AND FLUORANTHENES AND PROCESS FOR THEIR PREPARATION

Regis DuPont, Paris; Patrick Lardenois, Bourg-la-Reine; Claude Morel, Massy; Jonathan Frost, Palaiseau, all of France, and Gabor I. Koletar, Berkeley Heights, N.J., assignors to Synthelabo, Paris, France

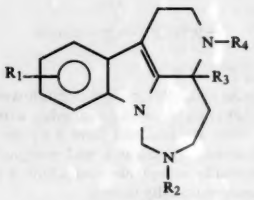
Filed Jul. 26, 1979, Ser. No. 60,857

Claims priority, application France, Jul. 28, 1978, 78 22352; Jul. 28, 1978, 78 22353

Int. Cl.³ A01N *43/48;* A61K *31/495*

U.S. Cl. 424—250 **8 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, halogen, alkyl or alkoxy; R_2 is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, benzyl, halogenobenzyl, alkylbenzyl, alkoxybenzyl, acyl, alkoxycarbonyl or alkylaminocarbonyl; R_3 is hydrogen or alkyl; and R_4 is hydrogen, alkyl, acyl or aroyl; each alkyl and alkoxy having from 1 to 4 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

4,277,477

METHOD OF USING 1,2-BENZISOTHIAZOLES

Helmut Hagen, Frankenthal; Rolf-Dieter Kohler, Mannheim, and Juergen Markert, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

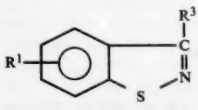
Division of Ser. No. 926,446, Jul. 26, 1978, abandoned. This application Oct. 2, 1979, Ser. No. 81,059

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734866

Int. Cl.³ C07D *275/04*

U.S. Cl. 424—251 **1 Claim**

1. A method of treating cardiac arrhythmia in humans and animals, comprising the administration of an effective amount of a 1,2-benzisothiazole of the formula



I

where R^1 is hydrogen; alkyl of 1 to 6 carbon atoms; alkyl of 1 to 6 carbon atoms substituted by carboxamido; cycloalkyl of 5 to 12 carbon atoms; phenyl or naphthyl, either of which may be fused; fused naphthoquinon-1,4-ylene; halogen; alkoxy of 1 to 4 carbon atoms, nitro, or

where:

the radicals R^2 are identical or different and each is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, aralkyl of 7 to 12 carbon atoms or phenyl;

R^3 is chloromethylphenyl, phenyl or naphthyl; phenyl or naphthyl which is substituted by one or two alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine, bromine or dialkylamino of 1 to 4 carbon atoms in the alkyl; or R^3 is a 5-membered or 6-membered heterocyclic ring which contains either two nitrogen atoms, or one nitrogen atom, or one oxygen atom, or one sulfur atom, or one nitrogen atom along with one sulfur atom, or one nitrogen atom along with one oxygen atom, or one oxygen atom with one sulfur atom.

4,277,478
ANTIBIOTIC AND USE THEREOF

Hans Zähner; Hannelore Drautz, both of Tübingen, Fed. Rep. of Germany, and Walter Keller, Dübendorf, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 920,742, Jun. 26, 1978, abandoned, which is a continuation of Ser. No. 687,268, May 17, 1976, abandoned. This application May 21, 1979, Ser. No. 41,279

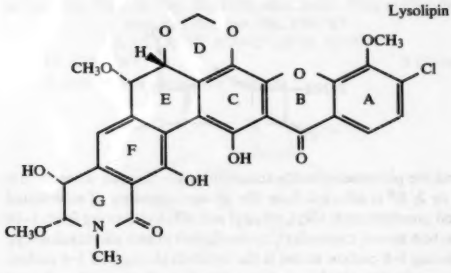
Claims priority, application Switzerland, May 20, 1975, 6477/75; Apr. 5, 1976, 4228/76; Fed. Rep. of Germany, May 15, 1976, 2621690; France, May 17, 1976, 76 14782; Israel, May 17, 1976, 49591; Canada, May 18, 1976, 252781; Czechoslovakia, May 18, 1976, 3305/76; Greece, May 18, 1976, 50739/205477; Hungary, May 18, 1976, CI 1665; Netherlands, May 18, 1976, 7605303; Spain, May 18, 1976, 448024; U.S.S.R., May 18, 1976, 2357857; Australia, May 19, 1976, 14080/76; Belgium, May 19, 1976, 167140; Denmark, May 19, 1976, 2214/76; New Zealand, May 19, 1976, 180898; South Africa, May 19, 1976, 76/2994; United Kingdom, May 19, 1976, 20649/76; Japan, May 20, 1976, 51-57357

Int. Cl.[3] A61K *31/535;* C07D *491/153*

U.S. Cl. 424—258 8 Claims

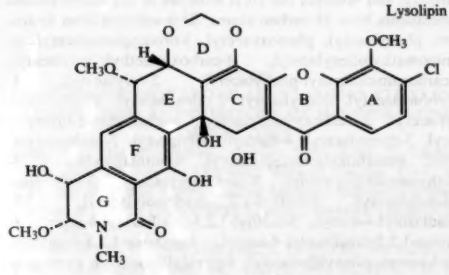
1. Lysolipin I of the formula

Lysolipin I



2. Lysolipin X of the formula

Lysolipin X



7. An antibacterial pharmaceutical composition comprising an antibacterially effective amount of Lysolipin I or of one of its acylates derived from an alkanoic carboxylic acid having from 1–7 C-atoms together with a pharmaceutical carrier.

8. An antibacterial pharmaceutical composition comprising an antibacterially effective amount of Lysolipin X or of one of its acylates derived from an alkanoic carboxylic acid having from 1–7 C-atoms together with a pharmaceutical carrier.

4,277,479
TETRAZOLYLALKOXYCARBOSTYRIL DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Takao Nishi, and Kazuyuki Nakagawa, both of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

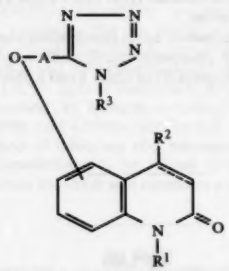
Filed Aug. 29, 1979, Ser. No. 70,710

Claims priority, application Japan, Sep. 1, 1978, 53/107869

Int. Cl.[3] A61K *31/47;* C07D *401/12*

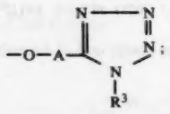
U.S. Cl. 424—258 28 Claims

1. A compound of the general formula,

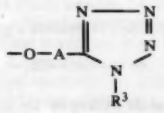


(I)

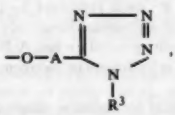
wherein R^1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkanoyl group, a benzoyl group or a phenyl-C_{1-4} alkyl group; R^2 is a hydrogen atom, a lower alkyl group or a group of the formula



$R^3$is a lower alkyl group, a C_{3-8} cycloalkyl group, a C_{3-8} cycloalkyl-C_{1-4} alkyl group, a phenyl group or a phenyl-C_{1-4} alkyl group; A is a lower alkylene group; the carbon-carbon bond between 3- and 4-positions in the carbostyril skeleton is either single or double bond; and the substituted position of the group represented by the formula,



in the carbostyril skeleton is either 4-, 5-, 6-, 7- or 8-position provided that only one such group of the formula can be substituted in the whole carbostyril skeleton, thus when R^2 in 4-position is



then 5-, 6-, 7- or 8-position will have no such substituted group; furthermore, the phenyl group in the above-mentioned benzoyl group, phenyl-C_{1-4} alkyl group or phenyl group may have substituted group(s) selected from the group consisting of

lower alkoxy, lower alkyl, halogen, di-lower alkylamino, nitro, and lower alkenedioxy.

25. A platelet aggregation inhibitor composition containing as an active ingredient a pharmacologically effective amount of a compound of the formula (I) of claim **1** and a pharmaceutically acceptable carrier.

26. A phosphodiesterase inhibitor composition containing as an active ingredient a pharmacologically effective amount of a compound of the formula (I) of claim **1** and a pharmaceutically acceptable carrier.

27. A cerebral blood flow improver composition containing as an active ingredient a pharmacologically effective amount of a compound of the formula (I) of claim **1** and a pharmaceutically acceptable carrier.

28. An anti-hypertensive agent composition containing as an active ingredient a pharmacologically effective amount of a compound of the formula (I) of claim **1** and a pharmaceutically acceptable carrier.

4,277,480

TETRAHYDROINDOLOISOQUINOLINES

David C. Horwell, Farnborough, and David E. Tupper, Bracknell, both of England, assignors to Lilly Industries Limited, London, England

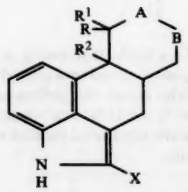
Continuation of Ser. No. 39,076, May 14, 1979, abandoned. This application Apr. 18, 1980, Ser. No. 141,752

Claims priority, application United Kingdom, May 23, 1978, 21355/78; Apr. 12, 1979, 1200/79

Int. Cl.[3] **C07D** *487/06;* **A61K** *31/475*

U.S. Cl. 424—258 **9 Claims**

1. An isoquinoline compound of formula (I)



(I)

wherein the moiety A-B represents a group of formula:

$$-CH_2-NR^3- \quad \text{or} \quad -NR^3-CH_2-;$$

wherein R^3 represents hydrogen, C_{1-16} alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl-C_{1-4} alkyl, benzyl, benzyl substituted with from 1–3 of the following substituents: halogen, methyl, methoxy, nitro; C_{3-6} alkenyl or C_{1-4} alkanoyl;

wherein R represents hydrogen, C_{1-6} alkyl, C_{3-6} cycloalkyl, benzyl benzyl substituted with from 1–3 of the following substituents: halogen, methyl, methoxy, nitro;

wherein R^1 and R^2 each represent hydrogen or taken together represent a chemical bond only except that R^1 and R^2 represent hydrogen only when A-B is $-NR^3-CH_2-$; and wherein X is hydrogen or halogen; or an acid-addition salt thereof.

7. A pharmaceutical formulation adapted for the treatment of mild anxiety states, schizophrenia and acute mania in unit dosage form comprising from 1–200 mg. per dosage unit of a compound for formula I as claimed in claim **1** or a pharmaceutically-acceptable salt thereof, associated with a pharmaceutically-acceptable carrier therefor.

4,277,481

ORGANIC COMPOUNDS

Jean-Marie Vigouret, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Apr. 14, 1980, Ser. No. 140,187

Claims priority, application United Kingdom, Apr. 18, 1979, 13456/79; Jan. 11, 1980, 01020/80

Int. Cl.[3] **A61K** *31/48, 31/475*

U.S. Cl. 424—261 **11 Claims**

1. A method of treating senile cerebral insufficiency, or treating bladder incontinence which comprises administering a therapeutically effective amount of the compound 6-methyl -8β-(2-pyridylthiomethyl)ergolene to a subject in need of such treatment.

4,277,482

3-SUBSTITUTED THIO-6-AMIDO-7-OXO-1-AZABICYCLO[3.2.0]-HEPT-2-ENE-2-CARBOXYLIC ACID S-OXIDES

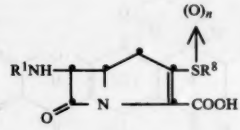
Burton G. Christensen, Scotch Plains; Ravindra N. Guthikonda, Perth Amboy; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 15, 1979, Ser. No. 84,934

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/40, 31/44*

U.S. Cl. 424—263 **3 Claims**

1. A compound having the structure:



and the pharmaceutically acceptable salts thereof; wherein: n is 1 or 2; R^8 is selected from the group consisting of substituted and unsubstituted: alkyl, alkenyl and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl; aralkyl, aralkenyl, and aralkynyl wherein the aryl moiety is phenyl and the linear chain has 1–6 carbon atoms; wherein the substituent or substituents relative to the above-named radicals R^8 are selected from the group consisting of: amino, mono-, di- and trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano and carboxy; and wherein the alkyl moieties of the above-recited substituents have 16 carbon atoms; R^1 is selected from hydrogen, phenylacetyl, phenoxyacetyl, 3-bromophenylacetyl, p-aminomethylphenylacetyl, 4-carboxylmethylphenylacetyl, 4-carboxamidomethyl-phenylacetyl, 2-furylacetyl, 5-nitrofurylacetyl, 3-furylacetyl, 2-thienylacetyl, 5-chlorothienyl-acetyl, 5-methoxythienylacetyl, α-guanidino-2-thienylacetyl, 3-thienylacetyl, 4-methylthienylacetyl, 3-isothiazolylacetyl, 4-methoxyisothiazolyacetyl, 4-isothiazolylacetyl, 3-methylisothiazolylacetyl, 5-isothiazolylacetyl, 3-chloroisothiazolylacetyl, 3-methyl-1,2,5-oxadiazolylacetyl, 1,2,5-thiadiazolyl-4-acetyl, 3-methyl-1,2,5-thiadiazolyl-4-acetyl, 3-chloro-1,2,5-thiadiazolyl-4-acetyl, 3methoxy-1,2,5-thiadiazolyl-4-acetyl, phenylthioacetyl, 4-pyridylthioacetyl, cyanoacetyl, tetrazolylacetyl, α-fluorophenylacetyl, D-phenylglycyl, 3-hydroxy-D-phenylglycyl, 2-thienylglycyl, 3-thienylglycyl, phenylmalonyl, 3-chlorophenylmalonyl, 2-thienylmalonyl, 3-thienylmalonyl, α-phosphonophenylacetyl, α-sulfaminophenylacetyl, α-hydroxyphenylacetyl, α-tetrazolylphenylacetyl and α-sulfophenylacetyl.

3. An antibiotic composition comprising a therapeutically effective amount of a compound according to claims **1** or **2** and a pharmaceutical carrier therefor.

4,277,483

1,4-DIHYDROPYRIDINE-DERIVATIVES WITH ANTIHYPERTENSIVE ACTIVITY

Carsten Materne, Bonn-Beuel, and Hans Betzing, Kerpen-Horrem, both of Fed. Rep. of Germany, assignors to A. Nattermann & Cie. GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 139,888

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1979, 2915355

Int. Cl.³ C07D *211/82;* A61K *31/44*

U.S. Cl. 424—263 6 Claims

1. The 2,6-dimethyl-4-(3'-nitrophenyl)-1,4-dihydropyridine-3-carboxylic acid beta-trimethylsilylethyl ester-5-carboxylic acid lower alkyl esters wherein the lower alkyl group is a straight or branched alkyl group from 1 to 4 carbon atoms.

4,277,484

1-BENZOTHIEPIN-4-CARBOXAMIDES

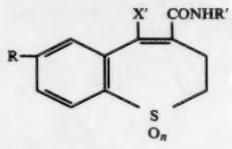
Melvin H. Rosen, Kendall, Fla., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 944,218, Sep. 20, 1978, Pat. No. 4,226,998, which is a division of Ser. No. 854,176, Nov. 23, 1977, Pat. No. 4,185,109, which is a continuation of Ser. No. 743,208, Nov. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 585,147, Jun. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,524, Sep. 26, 1974, abandoned. This application Feb. 8, 1980, Ser. No. 119,717

Int. Cl.³ A61K *31/445;* C07D *409/04*

U.S. Cl. 424—267 5 Claims

1. A compound having the formula



wherein R is chloro, X' is piperidino, R' is mono- or di-(fluoro or -chloro)-phenyl, and n is the integer 0 or 1.

4. An anti-inflammatory pharmaceutical composition comprising an anti-inflammatory effective amount of a compound as claimed in claim 1, together with a pharmaceutical excipient.

4,277,485

OXAZOLE OR ISOXAZOLE ALKYLAMINO ETHYLENE COMPOUNDS AS INHIBITORS OF H-2 HISTAMINE RECEPTORS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote; Charon F. Ganellin, Welwyn Garden City, and Hunter D. Prain, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

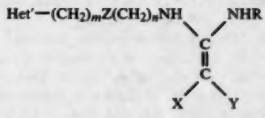
Division of Ser. No. 930,102, Aug. 1, 1978, Pat. No. 4,229,652, which is a division of Ser. No. 797,160, May 16, 1977, Pat. No. 4,124,717, which is a division of Ser. No. 629,174, Nov. 5, 1975, Pat. No. 4,046,907, which is a continuation-in-part of Ser. No. 468,617, May 9, 1974, Pat. No. 3,953,460. This application Feb. 4, 1980, Ser. No. 117,902

Claims priority, application United Kingdom, May 17, 1973, 23561/73

Int. Cl.³ A61K *31/42;* C07D *417/12*

U.S. Cl. 424—272 6 Claims

1. A compound of the formula:



wherein X and Y, which may be the same or different, are hydrogen, nitro, cyano or SO_2Ar but are not both hydrogen; Het' is an oxazole or isoxazole ring which ring is attached at a ring carbon and is unsubstituted or substituted by lower alkyl, hydroxyl, halogen or amino; R is hydrogen, lower alkyl or Het-$(CH_2)_mZ(CH_2)_n$; Z is sulphur or methylene; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4; Het is an oxazole, isoxazole or triazole ring which ring is attached at a ring carbon and is unsubstituted or substituted by lower alkyl, hydroxyl, halogen or amino; and Ar is phenyl unsubstituted or substituted by halogen or methyl or a pharmaceutically acceptable acid addition salt thereof.

6. A method of inhibiting H-2 histamine receptors which comprises administering to an animal in need thereof in an effective amount to inhibit said receptors a compound of claim 1.

4,277,486

1-[(SUBSTITUTED-NAPHTHYL)ETHYL]-IMIDAZOLE DERIVATIVES

Keith A. M. Walker, Los Altos Hills, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

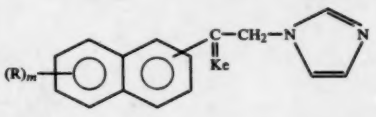
Filed Mar. 9, 1979, Ser. No. 19,202

The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.

Int. Cl.³ A61K *31/415;* C07D *233/60, 405/06*

U.S. Cl. 424—273 R 8 Claims

1. A compound of the formula



wherein m is an integer of 1, 2 or 3; R is independently selected from the group C_1 to C_6 alkyl, C_1 to C_6 alkoxy, halo, trifluoromethyl and hydroxy; Ke is selected from the group (i) a carbonyl group protected as an acyclic ketal derived from a monohydric straight chain alkanol having from one to four carbon atoms, (ii) a carbonyl group protected as a cyclic ketal wherein the cyclic ketal is selected from the group consisting of ethylenedioxy, 1,3-propylenedioxy, 1,2-propylenedioxy, 2,2-dimethyl-1,3-propylenedioxy, 1-methyl-1,3-propylenedioxy, 1,3-dimethyl-1,3-propylenedioxy and 2,3-butylenedioxy, (iii) a carbonyl group protected as an acyclic thioketal derived from a straight or branched chain alkylthio having from one to four carbon atoms or from thiophenol or benzylmercaptan, (iv) a carbonyl group protected as a cyclic thioketal derived from an alkylene dithio having two or three carbon atoms which may optionally be substituted by one or more methyl groups, or (v) a carbonyl group protected as a cyclic hemithioketal derived from 2-mercaptoethanol or 3-mercapto-1-propanol; and the pharmaceutically acceptable acid addition salts thereof.

7. A method of treating or preventing convulsions in a mammalian subject which comprises administering a therapeutically effective amount of a compound of claim 1 to a mammalian subject in need of such treatment.

8. A method of inhibiting gastric secretion in a mammalian subject which comprises administering a therapeutically effective amount of a compound of claim 1 to a mammalian subject in need of such treatment.

4,277,487
SUBSTITUTED 2-PHENYLAMINO-2-IMIDAZOLINES AS BRADYCARDIACS

Helmut Stahle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein, Fed. Rep. of Germany; Walter Kobinger, Vienna, Austria; Christian Lillie, Vienna, Austria, and Ludwig Pichler, Vienna, Austria, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

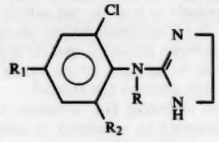
Filed Jul. 17, 1979, Ser. No. 58,165

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831671

Int. Cl.³ A61K *31/415;* **C07D** *233/50*

U.S. Cl. 424—273 R **3 Claims**

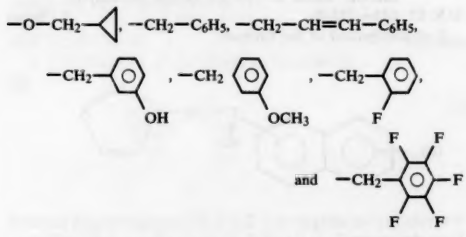
1. A compound of the formula



wherein

R_1 and R_2, which may be the same or different, represent a hydrogen atom, a chlorine atom, or a methyl group, with the proviso that not both R_1 and R_2 are hydrogen, and

R represents a radical selected from the group consisting of $-(CH_2)_2-C(CH_3)=CH_2$, $-(CH_2)_2-CH=CH_2$, $-O-CH_2-CH=CH_2$, $-O-(CH_2)_2-CH=CH_2$, $-O-CH_2-C(CH_3)=CH_2$, $-O-CH_2-CH=CH-CH_3$,



or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3. The method of slowing the heart rate of a warm-blooded animal in need thereof, which comprises perorally or parenterally administering to said animal an effective bradycardiac amount of a compound of claim 1.

4,277,488
WATER-SOLUBLE BIOTIN-CONTAINING PREPARATION

Takayoshi Mitsunaga, Ibaraki; Kiyoto Chinushi, Takatsuki, and Tadashi Umezu, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 2, 1980, Ser. No. 136,564

Int. Cl.³ A61K *31/415;* **C09K** *3/00*

U.S. Cl. 424—273 R **4 Claims**

1. A process for preparing a water-soluble biotin-containing preparation which comprises spray-drying an aqueous solution comprising biotin, lactose and ammonia to obtain dried particles containing biotin, wherein the weight proportion of biotin and lactose is from 1:40 to 1:100 and the amount of ammonia which is utilized is at least sufficient to dissolve the biotin in the solution.

4,277,489
1(P-CHLOROBENZOYL)-5-METHOXY-2-METHYL INDOLE-3-ACETIC ACID-3-OXO-ISOBENZOFURANYL ESTER AND PHARMACEUTICAL USE THEREOF

Guido Vandoni, Milan, Italy, assignor to Resfar S.r.l., Milan, Italy

Filed Feb. 7, 1980, Ser. No. 119,332

Claims priority, application Italy, Feb. 21, 1979, 20398 A/79

Int. Cl.³ A61K *31/40;* **C07D** *209/26*

U.S. Cl. 424—274 **3 Claims**

1. 1-(p-Chlorobenzoyl)-5-methoxy-2-methyl indole-3-acetic acid-3-oxo-1-isobenzofuranyl ester.

4,277,490
INSECTICIDAL 1-(2-NAPHTHYL)-CYCLOBUTANE CARBOXYLATE

George Holan, Brighton, and Reimund A. Walser, Box Hill, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

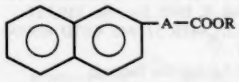
Filed Nov. 30, 1979, Ser. No. 98,715

Claims priority, application Australia, Dec. 4, 1978, PD6995

Int. Cl.³ A01N *43/30;* **C07C** *69/74, 121/75;* **C07D** *305/10*

U.S. Cl. 424—282 **21 Claims**

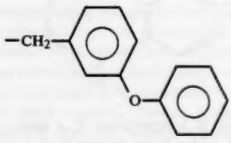
1. The (+), (−), and (±) forms of the compounds of the general formula I



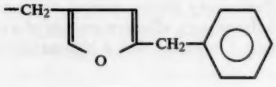
(I)

wherein R is one of the following groups (a) to (f):

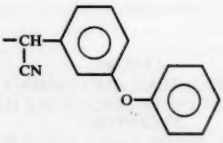
(a)



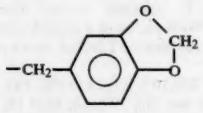
(b)



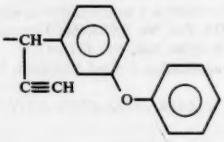
(c)



(d)

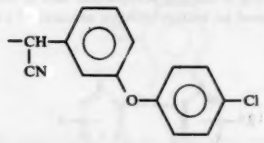


(e)



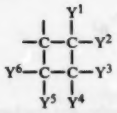
-continued

(I)



and A is the group Y

(Y)



wherein Y^1, Y^2, Y^3, Y^4, Y^5, and Y^6 are the same or different groups and each is hydrogen or a fluoro, bromo, chloro, or methyl group.

20. A method of controlling insects comprising applying an insecticidally effective amount of a compound of the formula of claim 1 to an area requiring insect control.

4,277,491

BICYCLIC PROSTAGLANDINS

Carmelo Gandolfi, Milan; Carlo Passarotti, Gallarate; Alessandro Andreoni, Cologno Monzese; Angelo Fumagalli, Monza; Franco Faustini, Milan; Roberto Ceserani, Milan, and Maria M. Usardi, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

Division of Ser. No. 859,703, Dec. 12, 1977, abandoned. This application Dec. 1, 1978, Ser. No. 965,267

Claims priority, application Italy, Dec. 31, 1976, 31041 A/76; Jan. 14, 1977, 19283 A/77; Mar. 14, 1977, 21171 A/77; Mar. 21, 1977, 21412 A/77; Mar. 31, 1977, 21863 A/77

Int. Cl.[3] **A61K** *31/557;* **C07D** *307/935*

U.S. Cl. 424—285 **20 Claims**

1. A compound selected from the group consisting of:

13t-6βH-6(9α)-oxide-15S-methoxy-16-methyl-16-butoxy-18,19,20-trinor-prostenoic acid, and the corresponding methyl ester, the 15R-epimer and the 6αH-diastereoisomers thereof;

13t-6αH-6(9α)-oxide-11α-hydroxy-15-oxo-16-methyl-16-butoxy-18,19,20-trinor-prost-13-enoic acid methyl ester and the corresponding free acid, as well as the 6βH-diastereoisomers thereof and the 5-chloro, 5-bromo and 5-iodo derivatives thereof;

13t-6 H-6(9α)-oxide-11α-hydroxy-15-oxo-16-methyl-16-butoxy-18,19,20-trinor-prost-13-enoic acid methyl ester and the corresponding free acid;

13t-6αH-6(9α)-oxide-11α,15R-dihydroxy-16-methyl-16-butoxy-18,19,20-trinor-prostenoic acid methyl ester and the corresponding free acid, the 15S-hydroxy-epimer and the 6βH-diastereosomers thereof;

13t-5-iodo-6βH-6(9α)-oxide-11α,15S-dihydroxy-16-methyl-16-butoxy-18,19,20-trinor-prost-13-enoic acid methyl ester and the corresponding free acid;

13t-5-iodo-6βH-6(9α)-oxide-11α,15S-dihydroxy-16-methyl-16-propoxy-18,19,20-trinor-prost-13-enoic acid methyl ester and the corresponding free acid;

13t-5-iodo-6βH-6(9α)-oxide-11α,15S-dihydroxy-16-methyl-16-amyloxy-18,19,20-trinor-prost-13-enoic acid methyl ester and the corresponding free acid.

and the pharmaceutically or veterinarily acceptable salts of the above mentioned acids.

10. 13t-5-iodo-6βH-6(9α)-oxide-11α,15S-dihydroxy-16-cyclohexyloxy-17,18,19,20-tetranor-13-prostenoic acid methyl ester as well as the 15R-hydroxy epimers, all the αH-diastereomers and free acids corresponding to said ester, and the pharmaceutically or veterinarily acceptable salts of said acids.

4,277,492

NOVEL 4-BIS((PHENYLMETHYL)AMINO)-BENZENESULFONIC ACIDS POSSESSING ANTIVIRAL ACTIVITY

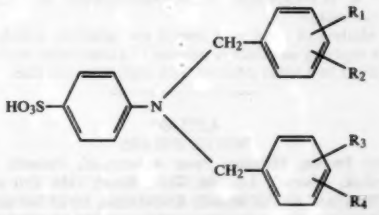
John K. Daniel, and Norton P. Peet, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1980, Ser. No. 152,000

Int. Cl.[3] **C07C** *143/58;* **A61K** *31/185;* **C07C** *121/00;* **A61K** *31/275*

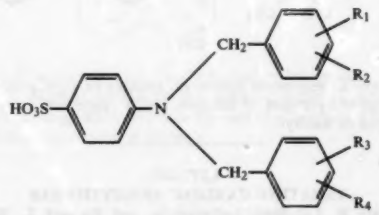
U.S. Cl. 424—304 **15 Claims**

1. A compound of the formula:



and the pharmaceutically-acceptable salts thereof wherein R_1 represents lower alkyl, lower alkoxy, nitro, amino, cyano, trifluoromethyl, acetyl, methylthio, methylsulfinyl, methylsulfonyl, aminosulfonyl or halogen; and R_2, R_3 and R_4 each independently represent hydrogen, lower alkyl, lower alkoxy, nitro, amino, cyano, trifluoromethyl, acetyl, methylthio, methylsulfinyl, methylsulfonyl, aminosulfonyl or halogen.

12. A method for inhibiting viruses which comprises contacting viruses or virus host cells with an effective virus inhibiting amount of a compound corresponding to the formula:



and the pharmaceutically-acceptable salts thereof wherein R_1 represents lower alkyl, lower alkoxy, nitro, amino, cyano, trifluoromethyl, acetyl, methylthio, methylsulfinyl, methylsulfonyl, aminosulfonyl or halogen; and R_2, R_3 and R_4 each independently represent hydrogen, lower alkyl, lower alkoxy, nitro, amino, cyano, trifluoromethyl, acetyl, methylthio, methylsulfinyl, methylsulfonyl, aminosulfonyl or halogen.

4,277,493

SUBSTITUTED N¹-VINYL-N¹-METHYL-N²-ARYL-FORMAMIDINES AND THEIR USE AS PESTICIDES

Akhileswar Sinharay; Gerhard Stähler, both of Frankfurt am Main, and Werner Bonin, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

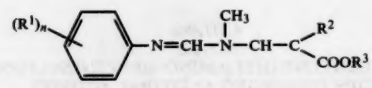
Filed Feb. 21, 1980, Ser. No. 123,279

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907090; Nov. 10, 1979, 2945460

Int. Cl.³ A01N *37/52;* **C07C** *121/84, 123/00*

U.S. Cl. 424—304 **15 Claims**

1. Substituted N^1-vinyl-N^1-methyl-N^2-aryl-formamidines of the formula I



(I)

in which

n is zero or a number from 1 to 3,

R^1 is halogen, (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, (C_1–C_4)-alkylthio, trifluormethyl, nitro, cyano, phenoxy, halophenoxy, phenylthio, or halophenylthio, in the case of n being 2 or 3 the radicals

R^1 possibly being identical or different,

R^2 is —CN or —$COOR^3$ and

R^3 is (C_1–C_8)-alkyl, (C_1–C_8)-alkoxyalkyl or (C_3–C_6)-cycloalkyl.

4. Method of combating insects and acaridae, which comprises applying an effective amount of a compound as claimed in claim 1 to a locus infected with insects or acaridae.

4,277,494

NOVEL ESTERS

Saleem Farooq, Ettingen; Peter Ackermann, Reinach; Jozef Drabek, Oberwil; Laurenz Gsell, Basel; Odd Kristiansen, Möhlin, and Rudolf Wehrli, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

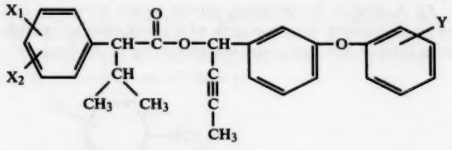
Filed Jun. 18, 1979, Ser. No. 49,362

Claims priority, application Switzerland, Jun. 27, 1978, 6991/78; Apr. 12, 1979, 3533/79

Int. Cl.³ A01K *31/215;* **C07C** *69/76*

U.S. Cl. 424—305 **8 Claims**

1. An acetate of the formula



wherein X_1 represents hydrogen, halogen or C_1–C_4 alkyl, X_2 represents hydrogen or halogen, and Y represents hydrogen, halogen or methyl.

4,277,495

TREATING CARDIAC ARRHYTHMIAS

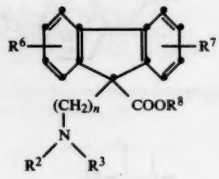
William B. Lacefield, Indianapolis, and Richard L. Simon, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 19,533, Mar. 12, 1979, abandoned. This application Apr. 17, 1980, Ser. No. 141,228

Int. Cl.³ A61K *31/195, 31/24, 31/445*

U.S. Cl. 424—309 **6 Claims**

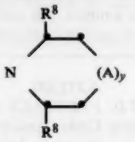
1. A method for treating cardiac arrhythmias comprising administering to a subject suffering from an arrhythmia and in need of treatment or to a subject suspected of being prone toward developing a cardiac arrhythmia and in need of prophylactic treatment an antiarrhythmic amount of a compound of the formula



wherein:

n is 3, 4 or 5;

R^2 and R^3 independently are hydrogen, C_1–C_6 alkyl, CH_2C_2–C_5 alkenyl, phenyl-C_1–C_3 alkyl, or taken together with the nitrogen to which they are attached are a cyclic group of the formula



in which

R^8 is hydrogen or C_1–C_4 alkyl; A is CH_2, O or NH; and y is zero or one;

R^6 and R^7 independently are hydrogen, C_1–C_4 alkyl or halogen;

and the pharmaceutically acceptable salts thereof.

4,277,496

METHODS OF TREATING MAMMALS SUFFERING FROM INFLAMMATION AND PAIN

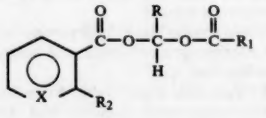
Mario A. Los, Capital Federal, Argentina, assignor to Laboratorios Bago S.A., Argentina

Division of Ser. No. 44,944, Jun. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 2,225, Jan. 9, 1979, abandoned. This application May 13, 1980, Ser. No. 149,442

Int. Cl.³ A61K *31/24, 31/235*

U.S. Cl. 424—309 **3 Claims**

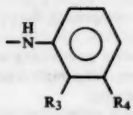
1. A method of alleviating pain and inflammation in mammals, including humans, suffering from pain and inflammation, which comprises; administering to the mammal an effective amount of a compound selected from those of the formula:



(I)

wherein X represents a moiety of formula:

R taken independently is hydrogen; R_1 taken independently is isobutyl; R_2 is a group of the formula:



wherein R_3 is selected from the group consisting of hydrogen and methyl, R_4 is selected from the group consisting of methyl and trifluoromethyl; and the pharmaceutically acceptable acid addition salts thereof.

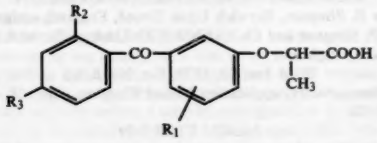
4,277,497

ANALGESIC 2-(M-BENZOYLPHENOXY)-PROPIONIC ACID DERIVATIVES

Jean-Pierre M. J. Fromantin, Versailles, France, assignor to Unicler, Paris, France

Filed Mar. 16, 1979, Ser. No. 21,311
Claims priority, application France, Mar. 20, 1978, 78 07962
Int. Cl.³ A01N *37/00*; C07C *63/37*
U.S. Cl. 424—316 **6 Claims**

1. A compound having the general formula (I)



wherein each of R_1, R_2 and R_3 is independently hydrogen or C_{1-4} alkyl, or a pharmaceutically acceptable amino acid salt thereof.

5. A pharmaceutical composition containing, as active substance, a compound according to claim 1 and a suitable carrier or diluent.

4,277,498

AMIDES

Frederick C. Copp; David Collard, both of Beckenham, and Clive V. Denyer, London, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 810,610, Jun. 27, 1977, abandoned. This application Jul. 23, 1979, Ser. No. 59,955
Claims priority, application United Kingdom, Jun. 28, 1976, 26794/76; May 26, 1977, 22204/77
Int. Cl.³ A61K *31/16*
U.S. Cl. 424—320 **44 Claims**

1. A glycinamide of formula:

NH_2CH_2CONHE

wherein E has seven to nine carbon atoms and is a group:

in which R^1 is hydrogen or methyl; L and M together form an alkyl or a cycloalkylalkyl group or a pharmacologically and pharmaceutically acceptable salt thereof.

4,277,499

COMBATING INSECTS WITH N-(SUBSTITUTED-PHENYL)-N-(2-CHLORO-6-FLUORO-BENZOYL)-UREAS

Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Odenthal; Albrecht Marhold, Leverkusen; Ingeborg Hammann, Cologne; Wilhelm Stendel, Wuppertal, and Ingomar Krehan, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 971,777, Dec. 21, 1978, abandoned. This application Feb. 1, 1980, Ser. No. 117,755
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801316
Int. Cl.³ C07C *127/22*; A01N *9/20*
U.S. Cl. 424—322 **6 Claims**

1. An N-(substituted-phenyl)-N′-(2-chloro-6-fluoro-benzoyl)-urea selected from the group consisting of
N-(4-trifluoromethylmercaptophenyl)-N′-(2-chloro-6-fluoro-benzoyl)-urea,
N-(4-trifluoromethoxyphenyl)-N′-(2-chloro-6-fluoro-benzoyl)-urea, and
N-[3-chloro-4-(trifluoromethylmercapto)]-phenyl-N′-(2-chloro-6-fluoro-benzoyl)-urea.

6. A method of combating insects which comprises applying to the insects, or to a habitat thereof, an insecticidally effective amount of a compound according to claim 1.

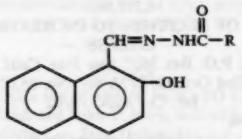
4,277,500

CERTAIN 2-HYDROXY-1-NAPHTHALDEHYDE ACYLHYDRAZONES AND THEIR USE AS FUNGICIDES

Ronald J. Rusay, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

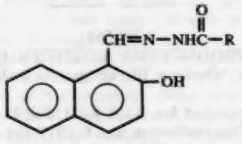
Filed Mar. 24, 1980, Ser. No. 132,957
Int. Cl.³ A01N *37/18*; C07C *103/20, 103/56, 103/75*
U.S. Cl. 424—324 **6 Claims**

1. Compounds having the following structural formula



where R is phenyl; alkyl C_1–C_4; benzyl or halophenyl.

5. A method of controlling fungi comprising applying thereto a fungicidally effective amount of a compound having the following structural formula



where R is phenyl; hydroxyphenyl; alkyl C_1–C_4; benzyl or halophenyl.

4,277,501

PARA-NITROPHENYLALKYLAMINES AND PHARMACEUTICAL COMPOSITIONS

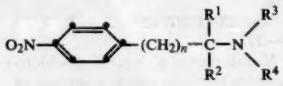
Bryan B. Molloy, North Salem, and Mitchell I. Steinberg, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 861,789, Dec. 19, 1977, abandoned. This application Dec. 10, 1979, Ser. No. 102,044

Int. Cl.³ A61K *31/135;* **C07C** *87/29*

U.S. Cl. 424—330 **14 Claims**

1. A compound of the formula



wherein:

n is 2–5;

R^1 is hydrogen or C_1–C_2 alkyl;

R^2 is hydrogen or C_1–C_3 alkyl;

R^3 is hydrogen or C_1–C_8 alkyl;

R^4 is C_5–C_{10} alkyl;

provided that when R^3 is hydrogen, R^4 is C_5–C_7 alkyl; and the pharmaceutically acceptable acid addition salts thereof.

4,277,502

PREPARING YEAST RAISED BAKERY PRODUCTS WITH GLANDLESS COTTON-SEED

Karl A. Kurzius, 4246 Eubank, NE., Albuquerque, N. Mex. 87111

Filed Dec. 6, 1979, Ser. No. 100,889

The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.

Int. Cl.³ A21D *2/36*

U.S. Cl. 426—20 **10 Claims**

1. The process for making yeast raised bakery products comprising:

combining at least the following ingredients:

cracked, glandless cotton-seed, including both its meal and its oil factions, water, salt, yeast, sour-culture and flour;

mixing said ingredients for fermentation in straight or sponge dough;

dividing the mixed combined ingredients into portions for baking;

proofing said portions;

and baking said proofed portions.

4,277,503

ADDITION OF LECITHIN TO INCREASE YIELD OF CHEESE

Robert R. Bily, P.O. Box 3637, San Jose, Calif. 95156

Filed Oct. 19, 1979, Ser. No. 86,672

Int. Cl.³ A23C *19/02*

U.S. Cl. 426—40 **4 Claims**

1. A process for producing cheese from milk wherein increased yield of cheese is obtained comprising mixing lecithin with liquid milk in an amount of from 0.001 percent to 0.15 percent by weight of the liquid milk prior to any coagulation of the milk, coagulating said liquid milk containing lecithin admixed therein to form solid curd and liquid whey, separating the curd and whey, and reccovering the curd from the whey.

4,277,504

PREMIX PRODUCT FOR A DIETETIC CAKE MIX

Sol B. Radlove, Wheeling, Ill., assignor to Ledges Associates, Roscoe, Ill.

Continuation-in-part of Ser. No. 818,531, Jul. 25, 1977, Pat. No. 4,185,127. This application Sep. 6, 1979, Ser. No. 73,106

Int. Cl.³ A21D *13/08*

U.S. Cl. 426—62 **8 Claims**

1. A premix product for use with bulk ingredients to make a dietetic cake mix, free of artificial sweeteners, said bulk ingredients having

(1) a main portion comprising flour, skim milk solids and dried egg whites;

(2) a shortening portion comprising a shortening;

(3) a sweetener comprising high fructose corn syrup; said premix product having:

an emulsifier portion comprising propylene glycol monostearate, lactated monoglycerides; and

a baking powder portion comprising an alkaline bicarbonate component and an acidic component which includes glucono delta lactone and the ratio by weight of the acidic component to the alkaline component is greater than about 1.5:1.0;

wherein the ratio of the emulsifier portion to the baking powder portion, by weight, is greater than about 0.4; and

wherein the glucono delta lactone is present in such a portion that when the premix product is combined with the bulk ingredients, the ratio by weight of the fructose to the acidic component is between about 10 and about 30 so that the cake baked from batter formed when the bulk ingredients are combined with the premix product and water is acidic with a pH of between about 3.5 and about 5.5, has acceptable sweetness, good appearance, volume, moisture, texture and mouth-feel.

4,277,505

PROCESS FOR THE MALTING OF GRAIN

Simon B. Simpson, Berwick Upon Tweed, England, assignor to J. P. Simpson and Co. (ALNWICK) Limited, Berwick Upon Tweed, England

Filed Jan. 22, 1979, Ser. No. 5,606

Claims priority, application United Kingdom, Apr. 21, 1978, 15799/78

Int. Cl.³ C12C *1/04*

U.S. Cl. 426—64 **2 Claims**

1. A process for the germination of cereal grain in malting which comprises the steps of passing a quantity of steeped grain in succession to and through a series of six closed spaced discrete vessels, the grain, upon leaving each vessel, discharging along a lower conveyor to an elevator which raises the grain to an upper conveyor that discharges the grain down into the next vessel with the germinating grain remaining in each vessel for about a day before being transferred to the next vessel, subjecting the developing grain in each vessel to upward flow of humidified attemperated air until a desired point of modification of the grain is attained with the grain leaving at last vessel of the series as a green malt, turning the grain either in a respective vessel or through transference to the next vessel and finally passing the grain to a malt kiln where it is dried to a required moisture level.

4,277,506

SUPPORTIVE SIDEWALL CONTAINER FOR EXPANDABLE FOOD PACKAGES

John J. Austin, LaGrange, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 24, 1980, Ser. No. 115,026

Int. Cl.³ B65D *81/34;* **B65B** *29/08*

U.S. Cl. 426—111 **12 Claims**

1. A non-metallic container housing an expandable food bag in a non-expanded stored condition and in an expanded condition upon heating, having a substantially increased volume, said container comprising:

a base portion including

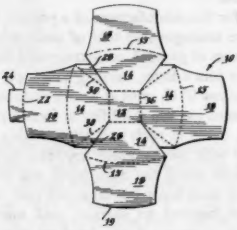
a bottom support panel of regular polygonal shape,

an upwardly and outwardly extending side panel connected to each edge of said polygonally shaped bottom support panel, with the distal edge of each said side panel being arcuate in configuration, with each one of said side panels being connected to the adjacent one thereof by overlapping V-shaped extension panels and being bowed radially

inwardly in a concave configuration to form with said bottom support panel a bowl receiving said expandable food bag in stored condition, and

an integral cover enclosing and storing said expandable food bag in said bowl and providing additional side support for the bag when open and the bag is expanded, said cover including

a plurality of overlapped, separate top panels, each top panel having an edge, resiliently and foldably connected to one of said side panels, along the arcuate edge thereof, each top panel also having an arcuate top edge and side edges



to compliment the shape of the upper edge of an adjacent side panel

one of said top panels being removably connected to a seal-tab, and

said seal being releasably attached to at least one of said remaining top panels, such that when said seal is released enabling the top panels of said cover to be opened, said side panels are capable of expanding and bowing radially outwardly to define a convex configuration thereby providing increased volume for said expandable food bag while confining said food bag within said container.

4,277,507

METHOD FOR INHIBITING THE GROWTH OF CLOSTRIDIUM BOTULINUM AND THE FORMATION OF ENTEROTOXIN IN SMOKED FISH PRODUCTS

John S. Thompson, Wayne, Pa., and Joseph F. Jadlocki, Jr., Mount Holly, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 140,328, Apr. 14, 1980. This application Sep. 8, 1980, Ser. No. 184,689

Int. Cl.³ A23B *4/02;* **A23L** *1/31*

U.S. Cl. 426—264 **7 Claims**

1. A method of inhibiting the production of enterotoxin from *Clostridium botulinum* and, upon cooking, inhibiting formation of nitrosamines from nitrite salt in smoked fish products which comprises the step of incorporating into fish a compound selected from the group consisting of hypophosphorous acid, sodium hypophosphite, potassium hypophosphite, calcium hypophosphite and manganese hypophosphite in an amount effective to inhibit production of enterotoxin from *Clostridium botulinum,* and less than 120 ppm of an alkali metal nitrite salt.

4,277,508

CURED MEAT PRODUCT AND PROCESS FOR PREPARING THE SAME

Kunito Sato; Alfred F. Miller, and Leonard J. Zimont, all of Scottsdale, Ariz., assignors to Armour and Company, Phoenix, Ariz.

Filed Sep. 10, 1979, Ser. No. 73,729

Int. Cl.³ A23B *4/02, 4/14*

U.S. Cl. 426—266 **9 Claims**

1. In a process for enhancing and stabilizing the color of cured meat, the step of incorporating into the meat sodium nitrite in an amount of from 0.0020% to 0.0156%, and calcium sorbate in an amount of from 0.01% to 0.8%, said percentages being by weight based on the weight of the meat, whereby the characteristic color of the cured meat is stabilized and preserved.

4,277,509

PROCESS FOR EXTRACTING GROUND ROASTED COFFEE

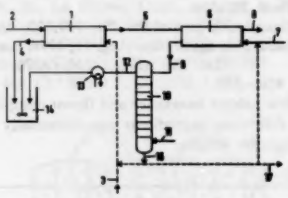
Hermanus A. J. Wouda, Utrecht, Netherlands, assignor to D.E.J. International Research Company B.V., Utrecht, Netherlands

Filed Oct. 2, 1978, Ser. No. 947,404

Claims priority, application United Kingdom, Oct. 6, 1977, 41570/77

Int. Cl.³ A23F *3/00*

U.S. Cl. 426—387 **9 Claims**



1. A multi-stage method for the primary extraction of ground roasted coffee, comprising the following two integrated steps:

(a) passing a stream of ground roasted coffee through a number of stages, at elevated temperatures between 60° and 120° at which substantially no hydrolysis of coffee solids occurs, countercurrently to a stream of aqueous extraction liquid to produce an extract of predetermined concentration, the ratio of liquid to coffee being in the range of 1.5:1 to 3:1, said aqueous extraction liquid extracting substantially all the soluble solids from said stream of ground roasted coffee to produce a concentrated liquid, which aqueous extraction liquid of itself would not be sufficient to extract all of the hydrophobic aroma components; and

(b) recovering substantially completely the hydrophobic aroma components from the extracted stream of ground roasted coffee without hydrolyzing said coffee by extraction with an aqueous extraction liquid at temperatures mentioned under (a) in combination with steam stripping of the extract produced by said hydrophobic aroma component extraction and recovering the aroma components as a concentrated aqueous aroma solution by condensation of the steam used for the stripping.

4,277,510

PROCESS OF MAKING POTATO CHIPS

Peter A. Wicklund, and John T. Ivers, both of Lewisville, Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 114, Jan. 2, 1979, abandoned. This application Mar. 4, 1980, Ser. No. 127,040

Int. Cl.³ A23B *7/03;* **A23L** *1/216*

U.S. Cl. 426—441 **9 Claims**

1. A process for preparing potato chips of relatively low oil content which comprises peeling potatoes, contacting the potatoes with boiling water or steam to gelatinize surface starch to a width of at least about 1/32 inch on the periphery of said potatoes, forming said potatoes into slices having a moisture content above above 70% by weight and a thickness of about 0.03 to 0.1 inch, drying the slices by exposing the slices to contact with a heated air stream at a temperature of about 170° F. to 320° F. whereby the average moisture content of the slices is reduced to about 30 to 65 percent by weight, contacting the resultant dried potato slices with steam under conditions whereby any moisture content increase is less than about 10 percent based on the total moisture content of the

potato slices just prior to steam treatment, and frying the steam-treated potato slices to provide potato chips of relatively low oil content of up to about 30% by weight.

4,277,511

SWEETENER AND FLAVORING COMPOSITIONS AND METHOD OF PRODUCING SAME

John B. Bliznak, Lombard, and Rudolph E. Harcarufka, Deerfield, both of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Continuation-in-part of Ser. No. 789,097, Apr. 20, 1977, abandoned. This application Aug. 11, 1978, Ser. No. 932,782

Int. Cl.³ A23L *1/236, 1/226*

U.S. Cl. 426—548 **1 Claim**

1. A low caloire sweetener and flavor composition containing the following ingredients in substantially the following percentages by weight:

	%
Corn starch hydrolysate	90
Ammoniated glycyrrhizin	2.5
Monosodium phosphate, anhydrous	3.5
Ethyl maltol	1

4,277,512

FOOD ADDITIVE COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Shigeo Inamine, Kobe; Toshio Matsuda, Itami, and Takeo Shimomura, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Veno Seiyaku Oyo Kenkyo, Osaka, Japan

Continuation of Ser. No. 2,318, Jan. 10, 1979, which is a continuation of Ser. No. 801,320, May 27, 1977, Pat. No. 4,168,323. This application May 20, 1980, Ser. No. 153,594

Claims priority, application Japan, Jun. 1, 1976, 51/62930; Apr. 22, 1977, 52/45917

Int. Cl.³ A21D *2/16*

U.S. Cl. 426—549 **12 Claims**

1. A process for improving the foaming properties of sponge cake dough which consists essentially of preparing a crystallized colloidally solidified, hydrophilic powder having a particle size of minus 20 mesh and comprising 60 to 99% of a dispersing medium which is a member selected from the group consisting of sugar alcohol, sugar and mixtures thereof, 30 to 0.5% of a food-grade surface-active agent and 30 to 0% of an edible oil or fat, by adding said food-grade surface-active agent and said edible oil or fat to said sugar alcohol, sugar and mixtures thereof in a heated liquid state so as to disperse said surface-active agent which is a member selected from the group consisting of glycerin fatty acid ester, propylene glycol fatty acid ester, sorbitan fatty acid ester, sucrose fatty acid ester, polyoxyethylene sorbitan fatty acid ester, lecithin and mixtures thereof, edible oil or fat therein, cooling and solidifying said dispersion to form a colloidal solid, said cooling also crystallizing said colloidal solid, pulverizing the crystallized colloidal solid and adding said pulverized solid to said sponge cake dough in an amount sufficient to improve the foaming properties of the sponge cake dough.

4,277,513

PROCESS FOR THE MANUFACTURE OF A FOODSTUFF HAVING A FIBROUS STRUCTURE SIMILAR TO THAT OF MEAT

Willy Rufer, Onex, and Robert Menzi, Geneva, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Continuation of Ser. No. 873,073, Jan. 27, 1978, abandoned. This application Dec. 5, 1979, Ser. No. 100,460

Claims priority, application Switzerland, Jan. 31, 1977, 1122/77

Int. Cl.³ A23J *3/00*

U.S. Cl. 426—656 **17 Claims**

1. A process for the manufacture of a protein foodstuff with a fibrous texture analogous to that of meat which comprises forming a wet mass of ground, non-structured protein material containing water into a layer, cooling said layer of material to a temperature below 0° C. until at least a portion but not all of the water contained therein solidifies to form a partially plasticized mass and, while in such condition, acting on the plasticized mass layer with means which applies a mechanical force at spaced locations along the mass layer and which does not carve or cut said mass layer but digs into said mass layer to a substantial depth beyond its surface, said mechanical force being sufficient to cause mechanical deformation of said plasticized mass layer and to cause the protein fibrils in the mass layer to rearrange and orient themselves in a manner and to an extent sufficient to impart to the whole body of the protein material a texture resembling that of meat.

4,277,514

FORGERY RESISTANT DOCUMENT WITH COLORED AREAS AND METHOD FOR THWARTING REPRODUCTION OF SAME

Takeo Sugiura, Tokorozawa; Keiji Miyajima, Chiba; Hideo Nagatomo, and Kiyoshi Masui, both of Saitama, all of Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Mar. 2, 1979, Ser. No. 16,721

Claims priority, application Japan, Mar. 7, 1978, 53-25662; Dec. 18, 1978, 53-158227

Int. Cl.³ A61B *5/10*

U.S. Cl. 427—1 **7 Claims**

1. An object with a colored surface pattern provided with a material containing at least one kind of coloring matter having a spectral reflection factor characteristic which exhibits a high spectral reflection factor in at least one of the wavelength ranges below 450 nm and above 650 nm, whereby reproduction of said colored surface pattern by means of any of a photocolor-copier and color photography utilizing photosensitive materials having spectral sensitivity in at least one of the wavelength ranges consisting of the human visible range and the adjacent wavelength ranges thereto is avoided, said coloring matter also having at least one high spectral reflection factor characteristic within the range between 450 nm and 650 nm so that a human viewer sees a color of said matter different from the color reproduced.

4,277,515

TARGETS FOR USE IN PHOTOCONDUCTIVE IMAGE PICKUP TUBES

Yasuhiko Nonaka, Mobara; Naohiro Goto, Machida, and Keiichi Shidara, Tama, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Division of Ser. No. 846,881, Oct. 31, 1977, Pat. No. 4,219,831. This application Oct. 11, 1979, Ser. No. 83,565

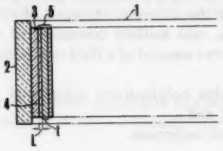
Claims priority, application Japan, Nov. 17, 1976, 51-137293

Int. Cl.³ B05D *1/36*

U.S. Cl. 427—76 **8 Claims**

1. A method for forming a P-type photoconductive film for a target for use in a photoconductive image pickup tube wherein said target comprises a transparent substrate, an N-type transparent conductive film deposited on said substrate, a

P-type photoconductive film deposited on said N-type transparent conductive film, and a heterojunction formed at the interface between said N-type transparent conductive film and said P-type photoconductive film, said P-type photoconductive film containing selenium, tellurium and arsenic, said selenium and arsenic being distributed continuously from said heterojunction throughout the thickness of said P-type photoconductive film and the distribution of said tellurium being



spaced from said heterojunction and localized in the vicinity of said heterojunction, said method comprising individually vapor-depositing a single substance consisting of selenium, tellurium, arsenic, an alloy of tellurium or an alloy of arsenic, in a first layer having a thickness less than 100 Å onto the N-type transparent conductive film and vapor-depositing a second different substance consisting of selenium, tellurium, arsenic, an alloy of tellurium or an alloy of arsenic in a second layer having a thickness less than 100 Å onto the first layer.

4,277,516

METHOD FOR GENERATING LAYERS ON A CARRIER FOIL

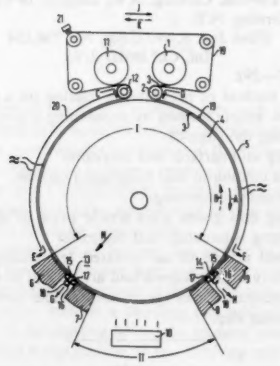
Reinhard Behn; Hermann Heywang, both of Munich, and Horst Pachonik, Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 28, 1979, Ser. No. 107,828

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1979, 2900772

Int. Cl.³ B05D 5/12; H01G 7/00

U.S. Cl. 427—81 **3 Claims**



1. A method for generating layers on a carrier foil, particularly for the manufacture of electrical capacitors, in which the carrier foil is unwound from a supply roll and passed through a first vacuum chamber while lying against the cylinder jacket of a drum and then passes through a vacuum lock into a second vacuum chamber where it is coated with metal and is returned while still lying against the cylinder jacket of the drum through a second vacuum lock into the first vacuum chamber after which it is wound onto a second supply roll, and in which a metal layer is applied to the foil in the second vacuum chamber, characterized in that the carrier foil (3) engages the cylinder jacket of the drum (4) in the first vacuum chamber (I); and the carrier foil (3) while lying against the drum (4), is successively conducted through a glow polymerization segment (5) mounted in the first vacuum chamber (I), then through a first vacuum lock (8, 9) then through the second vacuum chamber (II) wherein the metallization device (10) is mounted and then through a second vacuum lock (6, 7) back into the first vacuum chamber (I), and through a second glow polymerization segment (20) in the first vacuum chamber; and wherein carrier foil (3) is only removed from the cylinder jacket of the drum (4) just before it is supplied to a second supply roll (11).

4,277,517

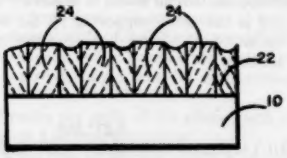
METHOD OF FORMING TRANSPARENT CONDUCTOR PATTERN

Elroy C. Smith, Jr., La Habra, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 925,245, Jul. 17, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,953

Int. Cl.³ B05D 5/12, 3/10, 1/36

U.S. Cl. 427—96 **4 Claims**



1. A method of forming a desired pattern of transparent electrical conductors on a base, comprising the steps of:

selecting a first material oxidizable to form a transparent insulating material;

selecting a modifying material combinable with said first material to form a second material, wherein said second material is oxidizable to form a transparent electrical conductor material;

forming a layer of said modifying material on said base in a pattern conforming to said desired pattern of transparent electrical conductors;

forming a layer of said first material adjacent said layer of modifying material on said base;

diffusing said modifying material into said first material to form said second material; and

oxidizing said first and second materials to form a substantially continuous layer of oxidized material having a transparent conductor region conforming to said desired pattern and a transparent insulator region.

4,277,518

SOLDER-COATING METHOD

Peter Schillke, and Robert R. Walls, both of Santa Barbara, Calif., assignors to Gyrex Corp., Santa Barbara, Calif.

Filed Nov. 13, 1979, Ser. No. 93,215

Int. Cl.³ C23C 1/04

U.S. Cl. 427—96 **15 Claims**

1. A continuous process for coating copper circuit tracks on a printed circuit board with solder to protect the copper track from oxidation and to facilitate subsequent soldering operations in which components are mounted on the circuit board, comprising:

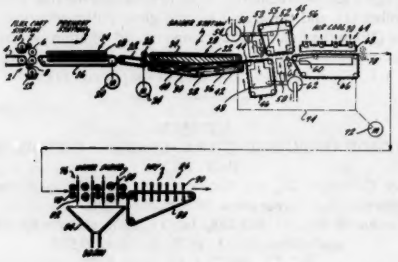
contacting a surface of a printed circuit board having a flux on the copper circuit tracks by a contact member positioned above the board so that one surface of the board is in facing contact with said contact member;

moving the contact member and the printed circuit board in contact therewith into a molten bath of solder;

displacing solder with the circuit board to produce a buoyant force pressing the board against the contact member

while the board remains immersed in the molten solder so that the molten solder contacts each surface of the board; and

moving the contact member through the molten bath at a speed which maintains contact between the circuit board and the contact member,



whereby the circuit board is immersed in the molten bath and is buoyantly supported by the molten bath as the circuit board is moved through the bath by the contact member.

4,277,519

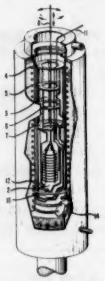
SIMULTANEOUS FORMATION OF GARNET EPILAYER ON A PLURALITY OF SUBSTRATES

Steven J. Licht, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 939,062, Sep. 1, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,597

Int. Cl.[3] B05D *5/12*

U.S. Cl. 427—129 9 Claims



1. A process for the simultaneous production of garnet epilayers on a plurality of substrates in a growth apparatus, said growth apparatus comprising a melt body a means for heating said melt body, and a substrate holder means wherein said substrates are aligned by said holder means so that a non-planar configuration is obtained, comprising the steps of introducing and immersing said substrates in said melt body, growing the epilayers on said plurality of substrates and removing said plurality of substrates from said melt body so that the lower substrates in said holder emerge last from said melt CHARACTERIZED IN THAT said melt body is mixed before growth, that said lower substrates are shielded from heat radiation from said melt body upon removal from said melt body, and that the major surfaces of said substrates are parallel with the surface of said melt during growth of an epitaxial layer on said substrates in said melt body but leave said melt at an angle of 10 degrees or more to the surface of said melt.

4,277,520

FREEZE MODIFICATION AGENT

Clyde G. Inks; John W. Compton, both of Taylor, Mich.; Kathryn M. Ellerman, Lakewood, Ohio, and Lee H. Bergman, Baton Rouge, La., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 14, 1980, Ser. No. 149,863

Int. Cl.[3] C10L *9/00*

U.S. Cl. 427—220 7 Claims

1. A method for treating particulate solids having surface moisture to reduce the cohesive strength of masses of said solids when frozen, said method consisting of coating such solids with an effective amount of a fluid composition comprising

(A) a water-soluble polyhydroxy compound or monoalkylether thereof and

(B) an alkali metal carbonate.

4,277,521

METHOD OF COATING THE INTERIOR SURFACES OF VEHICLES WITH POLYVINYL ACETATE

Robert F. June, Jr., 10286 W. Seven Mile, Northville, Mich. 48167

Filed May 31, 1977, Ser. No. 801,468

Int. Cl.[3] B62D *33/00*

U.S. Cl. 427—236 4 Claims

1. In a method for thermally insulatively coating the interior surface of a vehicle, the improvement which comprises:

(a) spraying onto the interior a polyvinyl acetate composition consisting essentially of:

(1) an aqueous polyvinyl acetate emulsion,

(2) monomeric ethylene glycol,

(3) a compound selected from the group consisting of cork, asbestos fibers and mixtures thereof, and

(b) impinging the spray upon said interior surface of said vehicle to adhere said composition to said interior surface to provide a thermal insulative coating thereupon.

4,277,522

COATING GLASS-CERAMIC SURFACES

William G. Dorfeld, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,154

Int. Cl.[3] B05D *3/12*

U.S. Cl. 427—292 6 Claims

1. In the method of providing a coating on a surface of a glass-ceramic article formed by ceramming a green glass article comprising the steps of

roughening said surface, and thereafter

applying a coating to said roughened surface,

the improvement comprising:

roughening said green glass article prior to the time that ceramming is initiated, and thereafter

heating said article to an elevated temperature which is sufficiently high to ceram said article and to substantially heal mechanical damage in said article caused by said roughening step.

4,277,523

METHOD OF PREVENTING TARNISHING OF POLISHED GLASS ARTICLES

Tetsuro Izumitani, Hino, and Eimei Miyade, Niiza, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Continuation of Ser. No. 497,346, Aug. 13, 1974, abandoned. This application Jan. 10, 1977, Ser. No. 758,272

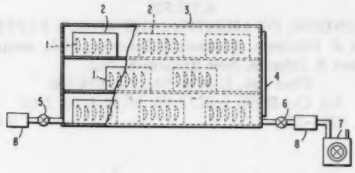
Claims priority, application Japan, Aug. 13, 1973, 48-90721

Int. Cl.[3] B05D *3/00;* B01J *19/00*

U.S. Cl. 427—294 8 Claims

1. A method of preventing tarnishing of a polished glass article by corrosion of the polished glass surface due to mois-

ture, which method comprises storing the polished glass article under a pressure of less than about 10^{-2} mm Hg Absolute and



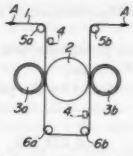
maintaining said pressure level until said polished glass surface is to be further processed in a tarnish-free condition.

4,277,524

METHOD AND APPARATUS FOR FINISHING COATED PAPERS

Hideiku Nakajima; Itsuji Koyama; You Kusama, and Yutaka Ashie, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 106,387
Claims priority, application Japan, Dec. 27, 1978, 53-162354
Int. Cl.³ B05D *3/00, 3/02, 3/12;* **B05C** *11/02*
U.S. Cl. 427—362 **16 Claims**



1. A method of finishing a coated paper web which is obtained by applying an aqueous coating composition containing thermoplastic synthetic resin emulsion to the surface of at least one side of a paper web to form a coating layer and drying the coating layer at a temperature to maintain said coating layer below the glass transition temperature of the thermoplastic synthetic resin emulsion, comprising:

a first finishing step of heating the surface of the coating layer of the coated paper web to a temperature above the glass transition temperature of the emulsion by passing the coated paper web on a finishing roll while bringing the surface of the coating layer into pressing contact with a mirror-like metal surface of the finishing roll heated to a temperature above the glass transition temperature of the emulsion;

a cooling step of reducing the temperature of the surface of the coating layer to a level not exceeding the glass transition temperature of the emulsion by 30° C.; and

a second finishing step of passing the coated paper web on one of said finishing roll and another finishing roll having a mirror-like metal surface heated to a temperature above the glass transition temperature of the emulsion, while bringing the surface of the coating layer into pressing contact with the mirror-like metal surface of said one finishing roll.

4,277,525

LIQUID COMPOSITIONS FOR FORMING SILICA COATING FILMS

Muneo Nakayama, Tokyo; Toshihiro Nishimura; Hisashi Nakane, both of Kawasaki; Shozo Toda, Fujisawa; Yoshio Hotta, Yamato, and Mitsuaki Minato, Kawasaki, all of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha and Tokyo Denshi Kagaku Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 1,681, Jan. 8, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 133,092
Claims priority, application Japan, Sep. 1, 1978, 53-107380
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—387 **14 Claims**

1. A liquid coating composition for forming silica-based coating films which comprises a product obtained by the reaction of a reaction mixture composed of

(a) an alkoxysilane represented by the general formula

$$R^1_nSi(OR^2)_{4-n},$$

where R^1 and R^2 are each a hydrocarbon group selected from the class consisting of methyl, ethyl, propyl, butyl, vinyl and phenyl groups and n is zero or 1;

(b) from 2 to 5 moles per mole of the alkoxysilane of a lower carboxylic acid containing 2 to 7 carbon atoms and having a dissociation index pK_a larger than 4.0, or an anhydride thereof; and

(c) from 2 to 10 moles per mole of the alkoxysilane of an alcohol containing 1 to 4 carbon atoms;

in the presence of a reaction accelerator which is an organic acid having a dissociation index pK_a up to 4.0.

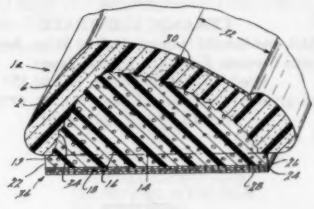
14. A method for forming a silica-based coating film on a substrate which comprises coating the substrate with a liquid coating composition of claim 1, drying the liquid coating composition and heating the thus dried coating composition at a temperature of at least 150° C.

4,277,526

PROTECTIVE AND DECORATIVE MOLDING HAVING FOAM-FILLED CHANNEL

Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Dearborn, Mich.

Continuation of Ser. No. 870,027, Jan. 16, 1978, abandoned. This application Jun. 8, 1979, Ser. No. 46,906
Int. Cl.³ B32B *3/30, 5/18, 7/04;* **B60R** *13/04;* **E04F** *19/02*
U.S. Cl. 428—31 **10 Claims**



1. A protective and decorative molding including an elongated, channel-shaped member comprising a plastic semi-rigid elastic material and having an inwardly facing surface defining an inner space, said inwardly facing surface being an uneven and irregular surface; a light-weight flexible, pliant foam bonded by surface attachment to said inwardly facing surface, said foam completely filling and extending beyond the inner space of said channel-shaped member, said foam presenting a generally planar surface adapted for attachment to a structural surface and said foam being compressible to substantially evenly distribute pressure against said structural surface and to provide a cushion between said channel shaped member and

said structural surface; and means for attaching said generally planar surface of said foam to said structural surface.

4,277,527

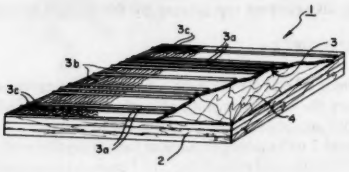
WALL CONSTRUCTION MATERIAL COMPRISING A RIGID SUPPORT WITH A TEXTILE MATERIAL FACING LAMINATED THERETO

Daniel Duhl, New York, N.Y., assignor to Polylok Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 838,889, Oct. 3, 1977, and Ser. No. 3,361, Jan. 15, 1979. This application Oct. 5, 1979, Ser. No. 82,324

Int. Cl.³ B32B *5/08, 5/12, 5/26, 13/14, 21/10*

U.S. Cl. 428—109 **20 Claims**



1. A laminated structure for use in wall construction comprising:

(a) a rigid support having a support surface; and

(b) an integrally self-lined textile material having a front surface and a rear surface, said material being adhesively bonded on its rear surface to the support surface and comprising:

(i) a nonwoven spun fibrous batting constituting the rear surface of the textile material;

(ii) a layer of filling disposed upon the batting;

(iii) one or more warp elements disposed upon the filling so as to constitute the front surface of the textile material; and

(iv) a single system of knitting thread wales, each wale comprising a multiplicity of warpwise looped stitch courses which engage and hold together the batting, filling and warp elements by loops of knitting thread on the rear surface of the textile material and by laps of the knitting thread courses on the front surface to bind together into an integrated unitary textile structure the batting, filling, and warp elements.

4,277,528

CERAMIC SUBSTRATE

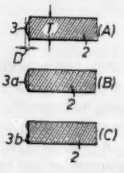
Takao Doi, and Satoshi Nomura, both of Shiga, Japan, assignors to Kyoto Ceramic Kabushiki Kaisha, Japan

Filed Nov. 20, 1979, Ser. No. 96,237

Claims priority, application Japan, Nov. 25, 1978, 53/145794

Int. Cl.³ B32B *3/02, 3/30*

U.S. Cl. 428—192 **8 Claims**



1. A ceramic substrate having an integral convex portion formed on the end faces of the outer circumference of the substrate, wherein said convex portion is disposed such that when said substrate comes into end face contact with a second substrate also having such a convex portion, the convex portions of each substrate will contact each other thereby reducing the likelihood of damage to said substrate

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4,277,529

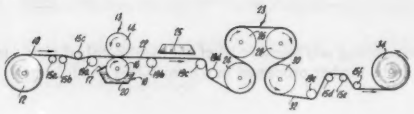
BONDING OF LIGHTWEIGHT TISSUE PAPER

Norman J. Friedman, Monmouth Junction, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 1, 1978, Ser. No. 874,166

Int. Cl.³ B05D *3/02, 5/00;* **B32B** *3/00, 7/00*

U.S. Cl. 428—211 **8 Claims**



1. Process for bonding lightweight, soft, and absorbent tissue paper to improve both wet and dry tensile strength while retaining softness and absorbency, which process comprises the steps of:

(a) applying an aqueous composition containing a curable resin binder to a dry web of lightweight, soft, and absorbent tissue paper; and

(b) subjecting the product of step (a) to elevated temperature to cure said resin binder and evaporate the water from said aqueous composition, wherein said aqueous composition contains:

(i) at least one polymer in latex form, said polymer being capable of self-crosslinking, or said polymer being capable of cross-linking by reacting with an aminoplast resin;

(ii) an aminoplast resin, said aminoplast resin being heat-curable, wherein the rate of cure of said aminoplast resin is

acceleratable in the presence of acid;

(iii) urea;

(iv) diammonium phosphate; and

(v) ammonium bromide.

5. The product produced by the process of claim 1.

4,277,530

ELECTRICAL STEEL LAMINATION

Robert F. Miller, New Kensington, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Sep. 10, 1979, Ser. No. 73,812

Int. Cl.³ B32B *15/18;* **H01F** *27/24*

U.S. Cl. 428—216 **17 Claims**

1. A laminated article for electrical applications comprising:

at least two sheets of electrical steel strip material, each having a thickness of less than 0.020 inch, each sheet being electrically isolated by a coating,

a thermoplastic adhesive layer having a thickness less than or equal to 0.001 inch between adjacent sheets, bonding the adjacent sheets to one another with a bond strength of at least 1,000 pounds per square inch as measured in uniaxial tension, without creating significant compressive stress in the plane of the sheets, said adhesive characterized by substantially instantaneous bonding at a temperature of less than 750° F.

16. A laminated article for electrical applications comprising:

at least two sheets of grain oriented silicon steel, each sheet having a thickness of less than 0.015 inch, each sheet being electrically isolated by a coating, and

a thermoplastic adhesive layer having a thickness less than or equal to 0.001 inch between adjacent sheets, bonding the adjacent sheets to one another with bond strength of at least 2,000 pounds per square inch as measured in uniaxial tension, without creating compressive stress in excess of

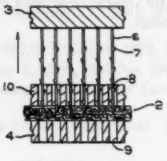
1,000 pounds per square inch in the plane of the sheets, and said adhesive characterized by substantially instantaneous bonding at a temperature of less than 750° F.

4,277,531

HIGH STRENGTH FIBER GLASS REINFORCED THERMOPLASTIC SHEETS AND METHOD OF MANUFACTURING SAME INVOLVING A REVERSE BARB NEEDLING PROCEDURE

Charles E. Picone, Shelby, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 6, 1979, Ser. No. 64,158
Int. Cl.³ B32B 5/06, 17/04; D04H 3/10, 3/12
U.S. Cl. 428—228 8 Claims



1. A fiber glass continuous strand mat suitable for reinforcing a resin matrix comprising a mat of continuous glass strands having at least two overlying layers of continuous glass strands and having continuous glass strands and/or filaments oriented in a direction transverse to the mat length, said continuous glass strands and/or filaments so oriented being entangled in the continuous glass strands forming the major portion of the mat and wherein one surface of the mat contains little or no glass filaments at that surface which are not in continuous form.

4. A fiber glass reinforced thermoplastic resin sheet having as primary reinforcement a fiber glass continuous strand mat in which a significant portion of the fiber glass continuous strand mat has fiber glass strands and filaments oriented in a direction transverse to the mat length and wherein the said fiber glass strands and filaments so disposed are entangled in the fiber glass continuous strands forming the major portion of the mat and wheren one surface of the mat contains little or no fiber glass fibers at the surface which are not in continuous strand form.

5. In the needling of a fiber glass continuous strand mat wherein a plurality of needles are passed through a mat surface as mat is advanced through a needling zone to thereby entangle glass strands in the continuous strand mat the improvement comprising:

penetrating the mat on the downward stroke of the needling machine with a needle that does not entangle any strands during said downward stroke but which penetrates the mat;

entangling strands of the mat in the needle during the upward stroke of the needling machine to move strands in the mat in contact with each needle vertically to orient such entangled strands in a direction vertical to the long axis of the mat and disengaging the strands so moved from the needle as it leaves the surface of the mat while providing for little or no fracturing of the strands so moved.

4,277,532

THERMALLY EXPANDABLE SEALANTS

Hubert Czepel, Linz; Franz Jilek, Gallneukirchen, and Heinz Zochbauer, Linz, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Aug. 27, 1979, Ser. No. 70,373
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841907
Int. Cl.³ B65D 53/06; B32B 5/16
U.S. Cl. 428—244 5 Claims

1. A thermally expandable sealant having good flow and creep for the sealing of joints, cavities or holes, which comprises as a carrier a fleece or fabric, made of glass or plastics material, which is coated with a composition based upon expandable graphite and containing, per 100 parts by weight of expandable graphite, 10 to 30 parts by weight of polychlorobutadiene, 1 to 40 parts by weight of an alkylphenol/formaldehyde resin and 1 to 3 parts by weight of stabilizers known per se.

4,277,533

WATERPROOFING SHEET MATERIAL

Charles A. Kumins, Gates Mills, and Milan L. Warford, Shaker Heights, both of Ohio, assignors to Tremco, Inc., Cleveland, Ohio

Division of Ser. No. 887,292, Mar. 16, 1978, which is a continuation-in-part of Ser. No. 798,566, May 19, 1977, abandoned. This application Oct. 26, 1979, Ser. No. 88,401
Int. Cl.³ B32B 9/04, 27/32; C08L 91/00
U.S. Cl. 428—332 6 Claims

1. A self-supporting sheet material suitable for use as a waterproofing membrane in roofing and other structural applications, said sheet having a thickness within the range of about 20 to about 90 mils and being composed of from about 15 wt.% to about 80 wt.% of a homopolymer of an alkene or a substituted alkene selected from the group consisting of polyethylene, chlorosulfonated polyethylene and polyisobutylene, and from about 85 wt.% to about 20 wt.% of a plasticized polyvinyl butyral resin.

4,277,534

ELECTRICAL INSULATING COMPOSITION COMPRISING AN EPOXY RESIN, A PHENOLIC RESIN AND A POLYVINYL ACETAL RESIN IN COMBINATION

Ralph G. Flowers, Pittsfield, Mass., assignor to General Electric Company, New York, N.Y.

Filed Dec. 12, 1979, Ser. No. 103,080
Int. Cl.³ B32B 15/02, 15/08; H01B 3/36, 3/40, 3/42
U.S. Cl. 428—379 8 Claims

1. A transformer wire having an insulating coating thereon, said coating having the composition defined within the accompanying triaxial diagram of FIG. 2 with the proviso that the composition contains from 10 to up to but not inclusive of 30% by weight epoxy resin.

3. A method for preparing electrical insulating coatings for transformer wires comprising the steps of:

preparing a composition from 10 to up to but not inclusive of 30 percent by weight epoxy resin, 24–38 percent phenolic resin and 36 to 66 percent polyvinyl acetal resin;

applying the composition to the transformer wire;

heating the coated transformer wire to a first temperature to fuse the coating; and

heating the coated wire to a second temperature to cause the coating to react.

4,277,535

MODIFIED PHENOLIC ALDEHYDE RESIN TO PRODUCE AN IMPROVED ADHESIVE COATING AND METHOD OF MAKING SAME

Mikhail M. Girgis, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 956,455, Oct. 31, 1978. This application Jun. 8, 1979, Ser. No. 47,594

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—389 **15 Claims**

1. A glass fiber cord having thereon the dried residue of an adhesive coating composition for binding glass fibers to rubber giving improved adhesion and decreasing the blowhole phenomenon, where the adhesive coating composition, comprises:

about 4 to about 20 weight percent of a resorcinol aldehyde resin modified with about 1 to about 10 weight percent of the resin of urea or thiourea or mixture thereof, and about 80 to about 90 weight percent of an elastomeric latex or mixture of latices wherein the adhesive coating composition is prepared by:

a. reacting resorcinol with an aldehyde selected from the group consisting of formaldehyde, paraformaldehyde, acetaldehyde, and mixture of one or more of these with hexamethoxymethylmelamine, or hexamethyltetramine and with urea or thiourea or mixture of urea and thiourea in an amount so that the ratio of said resorcinol to aldehyde is in the range of about 0.2 to about 2.0 and the ratio of said resorcinol to urea or thiourea or mixture thereof is in the range of about 0.2 to about 2.0 and the ratio of urea, thiourea or mixture thereof to the aldehyde is in the range of about 0.5 to about 5.0 in an acid or basic pH environment to produce a water-soluble, thermoplastic urea, thiourea, or mixture thereof modified resorcinol aldehyde resin,

b. combining the urea and/or thiourea modified resorcinol aldehyde resin produced in step "a" with an elastomeric latex or mixture of elastomeric latices.

2. A glass fiber cord having thereon the dried residue of an adhesive coating composition for binding glass fibers to rubber giving improved adhesion and decreasing the blowhole phenomenon, where the adhesive coating composition, comprises:

about 4 to about 20 weight percent of a phenolic aldehyde resin modified with about 1 to about 10 weight percent of the resin of thionamide having 1 to 6 carbon atoms or a mixture of thionamide and urea or thiourea, and about 80 to about 90 weight percent of an elastomeric latex or mixture of latices wherein the adhesive coating composition is prepared by:

a. reacting the phenolic compound with the aldehyde selected from the group consisting of formaldehyde, paraformaldehyde, acetaldehyde, and mixture of one or more of these with hexamethoxymethylmelamine or hexamethyltetramine and with thionamide having 1 to 6 carbon atoms or a mixture of the thionamide with urea or with thiourea or mixture thereof in an amount so that the ratio of the phenolic compound to aldehyde is in the range of about 0.2 to about 2.0 and the ratio of said phenolic compound to thionamide or mixture of thionamide and urea and/or thiourea is in the range of about 0.2 to about 2.0 and the ratio of thionamide or mixture of thionamide and urea and/or thiourea to the aldehyde is in the range of about 0.5 to about 5.0 in an acid or basic pH to produce a water soluble, thermoplastic thionamide or mixture of thionamide, urea and/or thiourea, modified phenolic aldehyde resin,

b. combining the modified phenolic aldehyde resin of step "a" with an elastomeric latex or a mixture of elastomeric latices.

4,277,536

BEAD POLYMERS OF VISCOUS DIMETHACRYLATES

Wolfgang Podszun, Cologne; Carlhans Süling, Odenthal; Michael Walkowiak, Leverkusen, and Hans H. Schulz, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,272

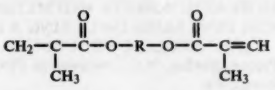
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849280

Int. Cl.³ B32B *27/28, 27/30;* C08F *20/20*

U.S. Cl. 428—402 **4 Claims**

1. A bead having a mean bead diameter of from 10 to 200 microns, said bead comprising

(a) 100 to 80% by weight of polymerized viscous dimethacrylate of the formula



wherein R is the residue of a diol, said viscous dimethylacrylate having a viscosity of from 0.5 to 500 Pa.s. measured at 25° C. using a rotary viscosimeter, and

(b) 0 to 20% by weight of at least one other copolymerized vinyl monomer.

4,277,537

PAINT COMPOSITION FOR THE SPECTRALLY SELECTIVE COATING OF METAL SURFACES, METHOD OF PRODUCING COATINGS THEREWITH AND AN ARTICLE PRODUCED THEREBY

Trevor P. Woodman, Im Breiteli 16, 8117 Fällanden, Switzerland

Filed Jan. 12, 1979, Ser. No. 3,127

Claims priority, application Switzerland, Feb. 18, 1978, 1734/78

Int. Cl.³ C08K *3/20*

U.S. Cl. 428—409 **14 Claims**

1. A paint composition for the spectrally selective coating of metal surfaces, comprising a pigment and a binder, said pigment comprising at least one metal oxide in powder form having a good transparency for heat radiation, said binder containing glycerol and said binder undergoes a physical or chemical change upon thermal conditioning thereof, the binder after conditioning, holding the pigment in place on a metal surface, such that a layer of the paint composition, after having been applied to the metal surface and conditioned, gives such metal surface at least a medium selectivity of between about 2.5 to 5.

11. A method for the fabrication of a body with a spectrally selective surface coating comprising the steps of:

providing a substrate having a metal surface which is to accept a paint composition;

coating a paint composition as an outer layer onto the metal surface of the substrate;

said paint composition comprising at least one metal oxide pigment in powder form having good transparency for heat radiation and a glycerol-containing binder which undergoes a physical or chemical change upon conditioning, holds the pigment in place on the metal surface; and

thermally conditioning the applied paint layers in a short period of time to thereby impart to the metal surface at least a medium selectivity of between about 2.5 to 5.

14. A body with spectrally selective surface coating made in accordance with claim **11**.

4,277,538

METHOD OF MANUFACTURING LAMINATED SAFETY GLASS

Rolf Beckmann, Siegburg, and Wilhelm Knackstedt, Hennef, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 738,402, Nov. 3, 1976, abandoned. This application Jan. 24, 1980, Ser. No. 114,801

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549474

Int. Cl.³ B32B *9/04, 17/06, 17/10*

U.S. Cl. 428—429 35 Claims

22. A laminate comprising a pair of silicate glass sheets bonded to a plasticized plastic sheet of a vinyl chloride containing polymer, said plasticized sheet containing a functional silane therein.

4,277,539

REFRACTORY ARTICLES AND COMPOSITE METAL-CERAMIC ARTICLES (CERMETS) PREPARED FROM A SILICATE-CONTAINING ALUMINUM TITANATE

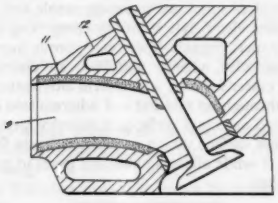
Hartmut Keller; Axel Krauth; Horst R. Maier; Horst Nink; Hans J. Pohlmann, all of Selb/Bayern; Horst Reddig, Marktredwitz, and Johann Siebels, Wolfsburg, all of Fed. Rep. of Germany, assignors to Rosenthal Technik AG, Fed. Rep. of Germany

Continuation of Ser. No. 957,917, Nov. 6, 1978, abandoned. This application May 2, 1980, Ser. No. 146,073

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1977, 2750290

Int. Cl.³ B32B *15/04;* C04B *35/44, 35/46*

U.S. Cl. 428—450 6 Claims



1. An article having a thermal shock coefficient R of 130 to 180 (W/cm), a heat insulation factor λ of 0.01 to 0.03 (W/cm K), a coefficient of expansion AK of $\pm 0.5 \times 10^{-6}$/°C., an elasticity modulus of approximately 1.4×10^3 (g/mm²) and a transverse strength δ_B of about 4.4 (g/mm²) and a crushing strength δ_D of about 77 (g/mm²), the article being non-wettable in respect to most NE metals and being alkali-resistant prepared from a silicate-containing aluminum titanate of raw ingredients having a grain size of below 0.6 μm and a chemical composition consisting essentially of from 50 to 60 weight % Al_2O_3, 40 to 45 weight % TiO_2, 2 to 5 weight % kaolinite and 0.1 to 1 weight % sepiolite.

4,277,540

THIN FILM MAGNETIC RECORDING MEDIUM

Harry E. Aine, 1804 Stierlin Rd., Mountain View, Calif. 94040

Continuation-in-part of Ser. No. 139,887, May 3, 1971, abandoned. This application Oct. 29, 1976, Ser. No. 736,814

Int. Cl.³ B32B *15/04*

U.S. Cl. 428—627 1 Claim

1. In a thin film magnetic recording medium, a substrate member, a film of magnetic recording material overlaying said substrate, and a protective film plating of material overlaying said film of magnetic recording material, such protective film plating material forming a non-particulate continuous plated film selected from the class consisting of tantalum, niobium, tungsten, refractory carbides and refractory nitrides.

4,277,541

PROTECTION OF ANHYDRIDE COPOLYMERS

Vincent A. Aliberti, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 1, 1979, Ser. No. 80,849

Int. Cl.³ B32B *27/08;* B05D *3/02;* B28B *1/24;* B29F *1/00*

U.S. Cl. 428—518 10 Claims

1. A process for the protection of the surface of a polymer comprising a vinylaromatic monomer and from 5 to 40 percent by weight of units derived from maleic anhydride which comprises applying to said surface a coating composition comprising a polymer with pendant hydroxyl groups.

2. A process according to claim 1 which comprises applying an aqueous solution of a polyvinyl alcohol to the surface of a polymer comprising a rubber-modified copolymer of styrene and maleic anhydride and heating to remove the solvent and adhere the coating to the polymer surface.

9. A process according to claim 1 in which the polymer comprising pendant hydroxyl groups is applied as a solution to the surface of the maleic anhydride polymer.

10. An article wherein the surface is protected by a process according to any one of claims 1, 9 and 2.

4,277,542

RESISTANCE MATERIAL

Alexander H. Boonstra; Cornelis A. H. A. Mutsaers, and Franciscus N. G. R. van der Kruijs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1979, Ser. No. 74,598

Claims priority, application Netherlands, Sep. 20, 1978, 7809554

Int. Cl.³ B32B *15/00*

U.S. Cl. 338—308 5 Claims

1. A resistance material consisting essentially of a mixture of at least one metal oxidic compound, a permanent binder and a temporary binder, at least one metal oxide and, as a resistance determining component, a barium-rhodate of the formula $BaRh_6O_{12}$.

5. A novel compound having the formula $BaRh_6O_{12}$.

4,277,543

ANODE FOR SOLID ELECTROLYTIC CAPACITOR AND METHOD FOR MAKING THE SAME

Koreaki Nakata, Takarazuka; Masahiro Oita, Kashiwara, and Hyogo Hirohata, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 26, 1979, Ser. No. 97,721

Claims priority, application Japan, Nov. 25, 1978, 53/145483; Apr. 10, 1979, 54/44068

Int. Cl.³ B22F *3/00, 5/00*

U.S. Cl. 428—546 8 Claims

1. An anode for a solid electrolytic capacitor consisting essentially of a porous sintered body made of tantalum powder particles, said particles having a layer of at least one metal selected from the group consisting of V, Mo and Pd thereon.

4. A method for making an anode for a solid electrolytic capacitor, comprising: coating the surface of a tantalum powder with at least one metal selected the group consisting of V, Mo and Pd; pressing the thus coated tantalum powder into a pressed body having a lead wire embedded therein; and sintering said pressed body in a vacuum or inert atmosphere.

4,277,544

POWDER METALLURGICAL ARTICLES AND METHOD OF BONDING THE ARTICLES TO FERROUS BASE MATERIALS

Thomas W. Pietrocini, Solon, Ohio, assignor to IPM Corporation, Columbus, Ohio

Filed Jan. 29, 1979, Ser. No. 7,067

Int. Cl.³ B22F *5/00*

U.S. Cl. 428—547 12 Claims

1. A ferrous base powder metallurgical article with an initial

part density of from about 5.8 to about 6.8 grams per cubic centimeter having a controlled area, including a contact area at which the part is adapted to be bonded to another material and at least a 0.025 inch margin of the surface of the article about the contact area surface, densified to at least 92% of full density to seal the interconnected porosity of the powder metallurgical material, with the increased densified area extending to a subsurface depth of at least 0.025 inch and less than 0.250 inch, while retaining the initial part density throughout the balance of the article.

5. A method of forming a powder metallurgical part having a controlled area, including a contact area at which the part is adapted to be welded to another ferrous base material and at least a 0.025 inch surface margin laterally continguous to the contact area, comprising:

compressing a ferrous base powder into a precision part having a density of at least 75% of theoretical full density, heat treating the precision article, and

subsequently applying inwardly directed localized surface pressure against the controlled area to provide at least a 92% dense surface area at the controlled area to a subsurface depth of from about 0.025 to about 0.250 inch, while substantially retaining the initial part density throughout the balance of the article.

9. A method of welding a ferrous base powder metallurgical part to a second ferrous base material comprising:

compressing a ferrous base powder into a precision part having a density of at least approximately 75% of theoretical full density, said part having a controlled area including a contact area at which the powder metal part is adapted to be welded to another part, and at least a 0.025 inch margin about the contact area,

subsequently applying inwardly directed, localized surface pressure against the controlled area to provide at least 92% dense controlled area at and about the contact area to a subsurface depth of from at least 0.025 to about 0.250 inch, and

welding the powder metallurgical part to the ferrous base material at the contact area.

4,277,545

NONAQUEOUS CELL

Tibor Kalnoki-Kis, Westlake, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 52,467, Jun. 27, 1979. This application May 6, 1980, Ser. No. 147,218

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—48 **14 Claims**

1. A nonaqueous cell comprising an active metal anode; a cathode collector; an ionically conductive cathode-electrolyte solution comprising a solute dissolved in an active liquid cathode; and wherein a vinyl polymer is dissolved in the cathode-electrolyte.

4,277,546

SEALED LEAD-ACID STORAGE BATTERY

Vyacheslav Z. Barsukov, ulitsa Gogolya, 6, kv.34; Sergei A. Dunovsky, prospekt Gagarina, 92, kv. 16; Lenik N. Sagoian, ulitsa Chernyshevskogo, 15, kv. 44, all of Dnepropetrovsk; Anatoly I. Trepalin, ulitsa Novoalexeevskaya, 11, kv. 58, Moscow; Igor A. Aguf, prospekt Metallistov, 18, kv. 79, Leningrad, and Valentina S. Smolkova, Revprospekt,32/2, kv. 79, Podolsk Moskovskoi oblasti, all of U.S.S.R.

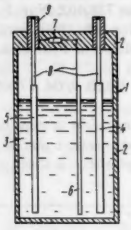
Filed Jan. 25, 1980, Ser. No. 115,372

Claims priority, application U.S.S.R., May 23, 1979, 2761312

Int. Cl.³ H01M *10/34*

U.S. Cl. 429—59 **7 Claims**

1. A hermetically sealed lead-acid storage battery which evolves gas during charging, said battery comprising a hermetically sealed container, a lead dioxide cathode located in said container, a lead anode located in said container, a gas absorbing electrode located in said container, said gas absorbing electrode consisting essentially of 20–80% by weight of an electrically conductive carbonaceous material and 80–20% by weight of a slightly water soluble quinoid compound having a low oxidation potential, and a liquid acid electrolyte located in said container and partially filling the same so as to define a gas



space in said container, said cathode, anode and gas absorbing electrode being in contact with the electrolyte and with the gas space, whereby upon charging of the battery gas formed in the container is absorbed by said gas absorbing electrode.

4,277,547

ALKALINE BATTERY SPEARATOR

Scott A. Verzwyvelt, Newbury Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 10, 1980, Ser. No. 128,747

Int. Cl.³ H01M *2/16*

U.S. Cl. 429—251 **7 Claims**

1. An alkaline storage cell separator that is gas permeable, structurally strong, chemically inert, with respect to aqueous alkaline electrolyte solutions, thermally stable and wettable in aqueous alkaline electrolyte solutions comprising a fabric felt of chemically inert organic fibers and porous inert inorganic metal oxide particles, wherein said fibers are characterized by non-wettable cutter surfaces which form intertestices at irregular intervals throughout said felt and wherein said oxide particles are sintered onto said surfaces to thereby form a wettable granular second surface which provides a means for retaining said electrolyte while allowing ions and gases to pass through said intertestices.

4,277,548

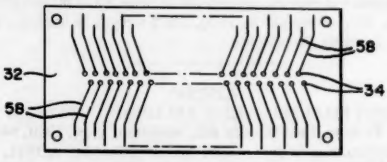
METHOD OF PRODUCING A CHARGE PLATE FOR USE IN AN INK RECORDER

James L. Vedder, Sunland, Calif., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 31, 1979, Ser. No. 108,604

Int. Cl.³ G03F *7/22*

U.S. Cl. 430—22 **3 Claims**



1. Method of producing a charge plate for an ink jet printer comprising the steps of:

(a) fabricating a master plate including a series of regularly spaced recesses,

(b) casting an elastomeric molding material against said master plate and into said recesses, thereby producing an elastomer mold comprising a base and a series of pins projecting outwardly from said base,

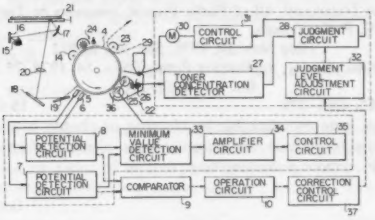
(c) separating said mold from said master,

(d) casting a curable, nonconductive plastic material against said mold,
(e) curing said plastic casting material to define a plastic charge plate structure having a series of regularly spaced charging tunnels,
(f) separating said charge plate structure from said mold,
(g) plating the surface of said charge plate structure with a layer of electrically conductive material,
(h) generating a positive working photographic master of the electrical lead artwork pattern for said charge plate utilizing said master plate, and
(i) forming an electrical lead extending from each of said charging tunnels by transferring said electrical lead artwork pattern to said charge plate structure and etching away said layer of electrically conductive material from the areas around said pattern.

4,277,549
COPY IMAGE ADJUSTMENT METHOD

Susumu Tatsumi, Hino; Tadahiro Eda, Narashino, and Chikara Imai, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Apr. 17, 1979, Ser. No. 30,896
Claims priority, application Japan, Apr. 26, 1978, 53-50323
Int. Cl.³ G03G *13/06*
U.S. Cl. 430—30 **10 Claims**



1. A copy image adjustment method for correcting copy image development characteristics for use in electrophotography comprising:
making a first standard copy image by copying a standard original;
copying said first standard copy image to make a second image;
detecting the image density of said standard copy during the copying process thereof to produce a detecting signal corresponding to the image density; and
resetting the development characteristics according to the detecting signal which is produced when the image density of said standard copy is detected.

4,277,550
PHOTOSENSITIVE SCREEN FOR ELECTROGRAPHIC APPARATUS

Masaji Nishikawa, and Norio Amemiya, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

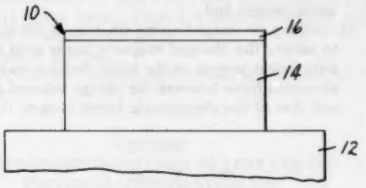
Continuation of Ser. No. 820,027, Jul. 28, 1977, abandoned. This application Mar. 30, 1979, Ser. No. 25,597
Claims priority, application Japan, Aug. 25, 1976, 51-100493
Int. Cl.³ G03G *15/00, 5/04*
U.S. Cl. 430—68 **4 Claims**

1. In a photosensitive screen for an electrographic apparatus comprising an electrically conductive mesh coated on one side with an insulating layer and an electrically conductive layer superimposed one upon the other in the order as mentioned and coated on the other side with a photosensitive layer, the improvement comprising: further providing an insulating thin film layer having a thickness of less than 1μ and covering at least that surface of said electrically conductive layer which makes contact with surrounding atmosphere to protect it against the surrounding atmosphere and improve its durability.

4,277,551
ELECTROPHOTOGRAPHIC PLATE HAVING CHARGE TRANSPORT OVERLAYER

Terry J. Sonnonstine, White Bear Lake, and Kenneth G. Kneipp, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 20, 1979, Ser. No. 67,883
Int. Cl.³ G03G *13/14, 5/04;* G03B *21/00*
U.S. Cl. 430—120 **14 Claims**



8. A method of imaging comprising
(a) providing an electrophotographic plate having a conductive substrate, a photoconductive-insulative layer overlying the substrate, and an electron transport layer overlying the photoconductive-insulative layer, the photoconductive-insulative layer comprising vitreous selenium and tellurium and alloys thereof, in which selenium is present in an amount within the range of 90 and 97.5 atomic percent and the electron transport layer comprising a coating of not greater than 35 weight percent of an aromatic or or heterocyclic organic electron acceptor dispersed in an organic binder, the photoconductive insulative layer having a thickness within the range of 40–100 μm and the electron transport layer having a thickness within the range of 1–5 μm such that the ratio of the thickness of the electron transport layer to that of the photoconductive-insulative layer is between 1:8 and 1:100,
(b) uniformly charging the plate to a predetermined positive potential, and
(c) exposing the plate to a source of radiation to which the transport layer is substantially transparent and to which the photoconductive-insulative layer is responsive to result in the photo-generation of electron-hole pairs such that said radiation passes through the transport layer and causes said electron-hole pairs to be generated, said electrons and holes then being transported to form a latent electrostatic charge image on the surface of the plate.

4,277,552
MAGNETIC DEVELOPING PROCESS AND TONER CONTAINING HIGH COERCIVE FORCE MAGNETIC POWDER

Masumi Asanae, and Kohji Noguchi, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Japan

Continuation-in-part of Ser. No. 23,000, Mar. 22, 1979, abandoned. This application Dec. 3, 1979, Ser. No. 99,853
Claims priority, application Japan, Mar. 23, 1978, 53-33530
Int. Cl.³ G03G *13/09*
U.S. Cl. 430—122 **10 Claims**

1. In a process for developing latent electrostatic images with a single component toner consisting essentially of a resin which is solid at ambient temperature and rendered molten under heating, coloring material, and a ferromagnetic powder, the toner being used in a developing apparatus having a latent image-bearing material for carrying the latent images and a magnet roll which includes a cylindrical rotatable shell and a rotatable permanent magnet member positioned coaxially

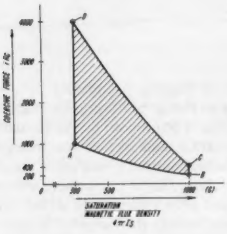
within the shell, the permanent magnet member having a plurality of adjacent axially extending magnetic poles, the process including the steps of

(a) attracting the toner to the surface of the magnet roll shell;

(b) conveying the single component magnetic toner on the shell surface to the latent image-bearing material having the electrostatic latent images previously disposed thereon by rotating at least one of the shell and the permanent magnet member to form a magnet brush of the single component magnetic toner;

(c) inducing an electric charge on the magnetic toner in the magnet brush on the shell surface adjacent the latent image-bearing material by subjecting the brush to the electric field due to the electric charge of the electrostatic latent images; and

(d) rubbing the image-bearing material by the magnet brush to adhere the charged magnetic toner onto the electrostatic latent images on the image-bearing material by the attraction force between the charge induced in the toner and that of the electrostatic latent images, the improvement comprising the initial step of selecting the magnetic toner and the permanent magnet member in respect to one another according to the following relation:



(i) the permanent magnet member to produce a magnetic field strength of at least about 400 gauss at its peak value on the shell surface;

(ii) the magnetic toner to comprise at most about 55%, by weight, of ferromagnetic powder; and

(iii) the magnetic toner to have saturated magnetic flux density $4\pi Is$ of a value between about 300 and 1,000 gauss and a magnetic property, in the relation between the saturated magnetic flux density $4\pi Is$ and the coercive force iHc of the magnetic toner, lying within the region on a graph of coercive force iHc, in oersteds, vs. saturation flux density $4\pi Is$, in gauss, above a line connecting a point where iHc is 1,000 oersted for $4\pi Is$ at 300 gauss and a point where iHc is 200 oersted for $4\pi Is$ at 300 gauss and below a line connecting a point where iHc is 400 oersted for $4\pi Is$ at 300 gauss and a point where iHc is 400 oersted for $4\pi Is$ at 1,000 gauss.

4,277,553

LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Kaoru Onodera; Noboru Mizukura, and Ryuichiro Kobayashi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

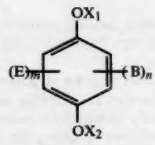
Filed Sep. 19, 1979, Ser. No. 76,543

Claims priority, application Japan, Sep. 20, 1978, 53-115454

Int. Cl.³ G03C *5/54, 1/10*

U.S. Cl. 430—216 **18 Claims**

1. A light sensitive color photographic material comprising a support and at least one hydrophilic colloid layer coated thereon which comprises a light-sensitive silver halide emulsion and an image dye-forming substance associated with said silver halide emulsion and, as a color fog inhibiting agent, a compound of the formula



wherein E is nitro, cyano, formyl, trihalogenomethyl, COR_7, or SO_2R_8, wherein R_7 is alkyl and R_8 is aryl, B is halogen, alkyl, aryl, alkoxy, alkenyl, cycloalkyl, aryloxy, carbamoyl, amido, or sulfamoyl, X_1 and X_2 are individually hydrogen or a group which is capable of being split off under alkaline conditions, m and n are 1–3, provided that at least one B is alkyl having 8–36 carbon atoms and $m+n=2$–4.

4,277,554

RESIN WITH A THIETANE RING, CROSSLINKABLE BY ELECTRON PHOTON IRRADIATION, AND PROCESS FOR USING SUCH A RESIN

Armand Eranian; Jean-Claude Dubois; André Couttet, and Evelyne Datamanti, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 14, 1979, Ser. No. 93,972

Claims priority, application France, Nov. 14, 1978, 78 32109

Int. Cl.³ B05D *3/06*

U.S. Cl. 430—270 **15 Claims**

1. A resin crosslinkable by electron or photon irradiation, comprising at least one substance the chemical formula of which contains a thietane ring:

13. Process for using a resin according to claim 1, for the purpose of forming a mask intended for the production of electronic components, comprising at least the following steps:

(a) dissolving the resin in a predetermined quantity of solvent;

(b) applying the solution thus obtained in a thin layer over a predetermined part of an electronic component substrate;

(c) treating predetermined portions of said substrate by irradiation.

4,277,555

ALUMINUM LITHOGRAPHIC PLATE WITH VISIBLE IMAGE AND PROCESS

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880, and Robert F. Gracia, Scituate, Mass., assignors to Howard A. Fromson, Weston, Conn.

Filed Oct. 12, 1979, Ser. No. 85,145

Int. Cl.³ G03C *1/94;* **G03F** *7/02*

U.S. Cl. 430—278 **5 Claims**

1. Lithographic substrate comprising an aluminum plate which has been treated with an alkali metal silicate to render the surface hydrophilic and negatively charged and thereafter ionically colored with a cationic dye.

4,277,556

PROCESS FOR TREATING LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Sigeharu Koboshi; Isamu Fushiki, both of Hino, and Kenro Sakamoto, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1977, Ser. No. 824,817

Claims priority, application Japan, Aug. 18, 1976, 51-98367; Dec. 16, 1976, 51-151339; Jun. 3, 1977, 52-66125

Int. Cl.[2] G03C 5/32, 7/16

U.S. Cl. 430—393 17 Claims

1. A method for processing a light-sensitive silver halide color photographic material which has been exposed to an image which comprises removing, after color development of said exposed light-sensitive silver halide color photographic material, the image silver with a bleach-fixing bath having a pH of between 2.0 and 5.5 and containing (i) hydrogen peroxide or sodium perborate in an amount of 0.05 mole to 3.0 moles/l and (ii) at least one organic acid or salt thereof selected from the group consisting of

lower aliphatic carboxylic acids having the general formula I or II and alkali metal salts, other than metal complex salts, of said carboxylic acids.

formula I

$$R_1—COOH$$

wherein R_1 is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms which may may be substituted with one or more of hydroxyl, alkyl having 1 to 3 carbon atoms and amino radicals;

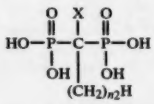
formula II

$$HOOC—(R_2)_{n1}—COOH$$

wherein R_2 is an alkylene or alkenylene group having 1 to 5 carbon atoms, each of which may be substituted with one or more of hydroxyl, alkyl having 1 to 3 carbon atoms, carboxyl and amino radicals, and n_1 is zero or 1; and

alkylidene diphosphonic acids having the general formula III and alkali metal salts thereof

formula III



wherein X is a hydrogen atom or hydroxyl, and n_2 is zero or an integer from 1 to 5.

the amounts of said aliphatic carboxylic acids of the formula I or II and said alkylidene diphosphonic acids of the formula III being 0.05 mole to 3.0 moles/l and 0.01 to 1.0 mole/l, respectively.

4,277,557

PHOTOGRAPHIC MATERIAL CONTAINING A STABILIZING AGENT

Gerhard Jäger, Wuppertal; Anita von König, Krefeld; Werner I[illegible]s, Leverkusen, and Armin Voigt, Cologne, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

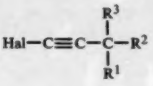
Filed Dec. 11, 1978, Ser. No. 968,269

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 2756030

Int. Cl.[3] G03C 1/34

U.S. Cl. 430—446 8 Claims

8. In a process for the production of photographic images by imagewise exposure of photographic material which contains at least one silver halide emulsion layer, development and stabilization of the silver halide, the improvement according to which development is carried out with a composition containing in a stabilizing amount at least one compound corresponding to the following formula or a salt thereof:



in which

R^1 represents an alkyl, aralkyl or pyridyl group or aryl which may be substituted with halogen or with a nitro, phenyl, phenoxy, alkyl, CF_3O or CF_3 group;

R^2 represents a hydroxyl group or an imidazolyl group;

R^3 represents an aryl group, which may be substituted with an alkyl group having from 1–4 carbon atoms or with halogen or with a nitro group,

Hal represents halogen

or a salt thereof, in an amount effective for stabilization of the silver halide.

4,277,558

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Shoji Kikuchi; Toshio Yajima; Kenichi Kishi; Takashi Sasaki, all of Hino; Keiichi Mori, and Haruhiko Sato, both of Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 21, 1980, Ser. No. 151,941

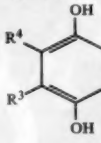
Claims priority, application Japan, Jun. 4, 1979, 54-69767

Int. Cl.[3] G03C 1/02

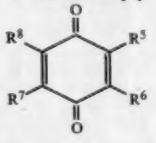
U.S. Cl. 430—542 7 Claims

1. A photographic material having a silver halide emulsion layer coated on a support, which contains a compound represented by the following general formula [I] and one represented by the following general formula [II]:

General formula [I]



General formula [II]



wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 each represent a hydrogen or halogen atom, an alkyl, cycloalkyl, alkenyl, aryl, acyl, acylamino, sulfone or sulfonamido group, which may be the same of different, and each of said groups may have a substituent which does not form a colored dye on reaction with an oxidation product of a developing agent.

4,277,559

NOVEL MAGENTA-FORMING COLOR COUPLERS AND THEIR USE IN PHOTOGRAPHY

Jan Jaeken, Hove, and André Verhecken, Mortsel, both of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Feb. 14, 1977, Ser. No. 768,192

Claims priority, application United Kingdom, Feb. 23, 1976, 7046/76

Int. Cl.[3] G03C 1/40, 7/00

U.S. Cl. 430—549 5 Claims

1. A photographic color element comprising a support and at least one silver halide emulsion layer comprising a colored 4-phenylazo-2-pyrazolin-5-one color coupler wherein the 4-phenylazo group of the coupler carries in the p-position relative to the azo group, a substituted alkoxy group of the formula:

$$—O—Alk—X—R$$

wherein:

Alk represents a straight-chain or branched-chain alkylene group, which may carry an aryl substituent,

X represents a member of the group consisting of O, S, CO, SO_2, SO_2O, CONQ, NQCO, SO_2NQ, and $NQSO_2$, Q being hydrogen, alkyl or aryl, and

R represents an aryl group.

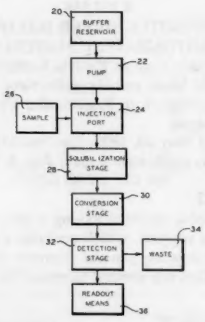
5. A photographic color element according to claim **1**, wherein the emulsion layer comprises in addition to the 4- phenylazo-2-pyrazolin-5-one color coupler, a colorless 2-pyrazolin-5-one color coupler.

4,277,560

ENZYME IMMUNOASSAYS USING IMMOBILIZED REAGENTS IN A FLOWING STREAM

Don N. Gray, and Melvin H. Keyes, both of Sylvania, Ohio, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Oct. 24, 1978, Ser. No. 954,269
Int. Cl.[3] C12M *1/34*; G01N *33/54, 21/00*
U.S. Cl. 435—7 **24 Claims**



1. A method for quantitatively determining the amount of an antigen contained in a biochemical fluid comprising obtaining sample of said fluid and mixing it in a mixing zone with an aqueous solution, passing said sample-solution into a solubilization stage containing an immobilized antibody which is specific to said antigen, said immobilized antibody initially having an immunochemically equivalent amount of reversibly bound an antigen-enzyme complex wherein said antigen of said complex is the same as the antigen in the sample, maintaining said sample-solution in said solubilization stage for a period of time and under conditions sufficient for a competitive equilibrium reaction to take place between the said antigen and said bound antigen complex, thereby displacing a quantity of said bound antigen complex from said immobilized antibody into said sample-solution; passing said complex-containing sample-solution into a conversion stage containing a substrate capable of reacting with said enzyme of said complex to produce a measurable reaction product in said sample-solution; passing said measurable reaction product-containing sample-solution into a detection stage wherein said measurable reaction product is quantitatively measured to obtain a reading, and comparing said measured reading to the quantitative amount of antigen in said original sample.

16. An apparatus for the quantitative determination of an antigen contained in an aqueous biochemical sample, comprising in combination, a reservoir containing a buffer diluent solution, mixing means for said diluent solution and said sample after they are combined, solubilization means to receive the mixed diluent solution and sample containing immobilized antibody initially saturated with an immunochemically equivalent amount of antigen-enzyme complex reversibly bound thereon, conversion means to receive the stream from the solubilization means containing immobilized reagent capable of reacting with said complex to produce a measurable reaction product, detection means capable of monitoring said measurable reaction product to produce a reading relatable to the amount of said antigen.

23. A method for determining the presence of an antigen in a biochemical fluid, comprising:

a. contacting a sample of said fluid with an immobilized antibody specific to said antigen, said antibody initially having bound thereto an immunochemically equivalent amount of enzyme-antigen complex, the antigen of said complex corresponding to said antigen,

b. equilibrating said sample and said immobilized antibody under conditions sufficient to replace enzyme-antigen complex bound to said immobilized antibody with said antigen and thereby liberating a portion of said bound complexes

c. reacting said liberated enzyme-antigen complex with a reactive substrate to produce a detectable product, and

d. detecting the presence of said product.

4,277,561

SUPPORT FOR THE DETERMINATION OF ENZYME ACTIVITIES AND PROCESS

Daniel Monget, and Paul Nardon, both of Villeurbanne, France, assignors to Laboratoire de Recherche API, La Balme-les-Grottes, France

Filed Feb. 16, 1977, Ser. No. 769,277
Claims priority, application France, Feb. 19, 1976, 76 05165
Int. Cl.[3] C12Q *1/54, 1/42, 1/00*; C12M *1/20*
U.S. Cl. 435—14 **16 Claims**

1. A support for the determination of enzyme activity in a biological extract comprising a fibrous material impregnated with a substrate labeled with a naphthol and a buffer solution selected from the group consisting of a first buffer solution suitable for a pH of enzyme activity over 7 and a second buffer solution suitable for a pH of enzyme activity of 7 or less and free from color developing agents; said fibrous material being loose in texture so as to be accessible both to products in solution and to said biological extract consisting of tissuey and cellular mash or whole cells and sufficiently fine to permit adsorption and uniform distribution of reagents over the area thereof; and said naphthol substrate originally being colorless or pale yellow so that any subsequent coloration of the substrate, which results from coupling of said naphthol released therefrom with a diazonium salt color-developing agent to indicate the presence of enzyme activity, is readily apparent.

5. An apparatus for determining enzyme activity in a biological extract comprising:

(a) a tray having a plurality of cups contained therein; and

(b) a plurality of discs located in the bottom of said cups, said discs being composed of a fibrous material impregnated with a substrate labeled with a naphthol and a buffer solution selected from the group consisting of a first buffer solution suitable for a pH of enzyme activity over 7 and a second buffer solution suitable for a pH of enzyme activity of 7 or less, and free from coloring agents; said fibrous material being loose in texture so as to be accessible both to products in solution and to biological samples of tissuey and cellular mash or whole cells and sufficiently fine to permit adsorption and uniform distribution of reagents over the area thereof and said naphthol substrate originally being colorless or pale yellow so that any subsequent coloration of the substrate, which results from coupling of the naphthol released therefrom with a diazonium salt color-developing agent to indicate the presence of enzyme activity, is readily apparent.

9. A method of determining enzyme activity comprising:

(a) preparing a biological extract of the enzyme whose activity is to be determined;

(b) depositing a sample of said extract on a support comprising a fibrous material impregnated with a substrate labeled with a naphthol and a buffer solution selected from the group consisting of a first buffer solution suitable for a pH of enzyme activity over 7 and a second buffer solution

suitable for a pH of enzyme activity of 7 or less, and free from color-developing agents; said fibrous material being loose in texture so as to be accessible both to products in solution and to biological samples of tissuey and cellular mash or whole cells and sufficiently fine to permit adsorption and uniform distribution of reagents over the area thereof; said substrate originally being colorless or pale yellow so that any subsequent coloration of the substrate, which results from coupling of the naphthol released therefrom with a color-developing agent to indicate the presence of enzyme activity, is readily apparent;

(c) incubating said sample;

(d) depositing on said support a developing reagent comprising a wetting agent, a buffer suitable for use at the desired pH and a diazonium salt color-developing agent for coupling with said released naphthol whereby the reactions are brought to a pH optimal for the colorimetric reaction between said substrate and said color-developing agent;

(e) photochemically decomposing any unreacted color-developing agent; and

(f) comparing said color reactions to a color scale indicative of the activity of the enzyme.

4,277,562

STABILIZED LIQUID ENZYME AND COENZYME COMPOSITIONS

Ivan E. Modrovich, 1043 Mesa Dr., Camarillo, Calif. 93010

Continuation-in-part of Ser. No. 722,565, Sep. 13, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,678

Int. Cl.³ C12Q *1/50*; C12N *9/96*

U.S. Cl. 435—17 **56 Claims**

1. A multi-reagent liquid enzyme and coenzyme composition used in biological diagnostic determinations of biological constituents and which enzymes and coenzymes are normally unstable in an aqueous medium, said composition comprising:

(a) a first liquid reagent comprised of:

(1) at least 35% V/V of a non-reactive aqueous vehicle,

(2) at least a sufficient amount of coenzyme to perform a determination dissolved in said aqueous vehicle and cooperating in a determination reaction, said coenzyme being normally unstable in the aqueous medium, and

(3) an aqueous miscible polyol organic solvent dissolved in said aqueous vehicle in an amount of about 35% to about 55%, and which is liquid at least at room temperature when dissolved in said vehicle,

(b) a second liquid reagent comprised of:

(1) at least 35% V/V of a non-reactive aqueous vehicle,

(2) an aqueous miscible polyol organic solvent dissolved in said aqueous vehicle in an amount of about 10% to about 50%, and which is liquid at least at room temperature when dissolved in said vehicle,

(3) at least 5000 I.U. per liter of enzyme dissolved in said aqueous vehicle and cooperating in a determination reaction, said enzyme being normally unstable in the aqueous medium and normally reactive in the presence of the coenzyme in the aqueous medium, and

(4) a labile substrate in said aqueous vehicle and cooperating in a determination reaction and which substrate is normally reactive with said enzyme in the aqueous medium in absence of being stabilized;

(c) a third liquid reagent comprised of:

(1) a non-reactive aqueous vehicle,

(2) a buffering agent capable of maintaining a pH in said aqueous vehicle in a range sufficient to prevent degradation of a labile component, and

(3) at least one additional labile component which is normally unstable in the aqueous media and capable of cooperating in and activating a determination reaction;

(d) whereby said first and second and third reagents may be combined in proper amounts to form a working composition for a biological diagnostic determination so that the resultant composition in liquid form can be used for such determination, said composition being stabilized for a substantial period of time without significant degradation of the labile component and enzyme and coenzyme and substrate.

4,277,563

PREPARATION OF FRUCTOSE

Pieter L. Kerkhoffs, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Nov. 19, 1979, Ser. No. 95,680

Claims priority, application Netherlands, Nov. 18, 1978, 7811389

Int. Cl.³ C12P *19/14*

U.S. Cl. 435—99 **9 Claims**

1. A process for preparing fructose from plant parts containing a fructose polymer, said process consisting essentially of:

(1) contacting minced plant parts containing a fructose polymer in an aqueous medium with an enzyme that hydrolyzes fructose polymers and hydrolyzing said polymers to produce fructose;

(2) removing plant parts from the aqueous reaction solution; and

(3) isolating the fructose so produced from the aqueous reaction solution.

4,277,564

PREPARING ENTOMOCIDAL PRODUCTS WITH OLIGOSPOROGENIC MUTANTS OF BACILLUS THURINGIENSIS

Donovan E. Johnson, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 9, 1980, Ser. No. 110,864

Int. Cl.³ C12N *3/00*

U.S. Cl. 435—242 **9 Claims**

1. A method of producing a *Bacillus thuringiensis* parasporal product substantially free of contaminating spores comprising culturing an oligosporogenic mutant of *Bacillus thuringiensis* subspecies kurstaki having the identifying characteristics of a strain selected from the group consisting of NRRL B-4453, NRRL B-4454, NRRL B-4455, NRRL B-4456, NRRL B-4457, and NRRL B-4458 on a nutritionally sufficient medium whereby the vegetative cells of said mutant culture produce spores and parasporal crystals in a spore:crystal ratio of less than about 1:800, and recovering said substantially spore-free parasporal product.

4,277,565

MACROMOLECULAR ADSORBENT CONTAINING PENDANT DIFLUOROALKYL PHOSPHATE GROUPS FOR ADSORBING HEAVY METAL IONS

Yoshio Oda, Yokohama; Masaaki Yamabe, Machida, and Masao Kato, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Mar. 29, 1979, Ser. No. 25,102

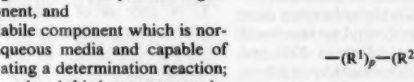
Claims priority, application Japan, Apr. 12, 1978, 53/42150

Int. Cl.³ C08F *230/02*, *8/40*; C01G *43/00*

U.S. Cl. 521—31 **13 Claims**

1. A macromolecular adsorbent capable of adsorbing heavy metal ions, which comprises:

a polymer having pendant groups of the formula:



$$-(R^1)_p-(R^2)_q-R_f-(R^3)_r-(O)_t-\overset{O}{\overset{\|}{P}}X^1X^2$$

wherein R′ is a C_1–C_8 divalent organic group; R^2 and R^3 are each a C_1–C_5 divalent organic group: p, q, r and l each are 0 or 1; R_f is a C_1–C_{10} divalent perfluoro group; and X^1 and X^2 each are hydroxyl or a substituent convertible to a hydroxy group.

4,277,566

CHELATE RESIN PREPARED BY AFTERTREATMENT OF AMINATED RESIN WITH POLYFUNCTIONAL COMPOUND AND AMINE

Yushin Kataoka; Masaaki Matsuda, and Masaru Kamoda, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 5, 1979, Ser. No. 17,324

Claims priority, application Japan, Mar. 24, 1978, 53-34567; Apr. 3, 1978, 53-39602

Int. Cl.³ C02F *1/62*; B01J *39/18*

U.S. Cl. 521—32 **9 Claims**

1. A process for producing a chelate resin which comprises reacting at a temperature of about 30° to 200° C.

(A) a resin having one or more primary and/or secondary amino groups in the molecule and being selected from the group consisting of polyethyleneimine, aniline resin, melamine resin, and resins aminated by reacting a resin with ammonia, aliphatic mono- or polyamines, aromatic mono- or polyamines or derivatives thereof, with

(B) a polyfunctional compound having at least two amine-reactive groups and

(C) an amino compound having one or more primary and/or secondary amino groups, the polyfunctional compound (B) and the amino compound (C) being used in an amount of 1/20 mole or more and 1/20 mole or more, respectively, per equivalent weight of the amino group in resin (A), or

a reaction product of the polyfunctional compound (B) and the amino compound (C), the reaction product being used in an amount of 1/20 mole or more per equivalent weight of the amino group in the resin (A).

4,277,567

FLAME-RETARDANT VINYL AROMATIC POLYMER COMPOSITIONS

Donald A. Keyworth, Houston, Tex., and David C. Purpi, Woodcliff Lake, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Dec. 10, 1973, Ser. No. 423,561

Int. Cl.³ C08K *5/02*

U.S. Cl. 521—56 **13 Claims**

1. A flame-retardant resinous composition comprising a vinyl aromatic polymer and a flame-retarding amount of 1,1,2,3,4,4-hexabromobutene-2.

4,277,568

SEALANT MATERIAL

Joseph A. Davison; Graham W. Hall, both of Cheltenham; Newton J. Hodges, Charlton Kings, and David W. Price, Cheltenham, all of England, assignors to Coal Industry (Patents) Limited, London, England

Division of Ser. No. 109,023, Jan. 2, 1980, which is a continuation of Ser. No. 777,055, Mar. 14, 1977. This application Jul. 22, 1980, Ser. No. 171,229

Claims priority, application United Kingdom, Apr. 12, 1976, 13420/76

Int. Cl.³ C08J *9/30*

U.S. Cl. 521—68 **7 Claims**

1. The sealant composition comprising a coke oven door sealant for coke oven doors and joints and like installations which coke oven doors sealant remains effective as a sealant to prevent gas leakage from coke oven doors and joints and the like at temperatures up to about 200° C., the coke oven door sealant having from about 25 to 55% polyvinyl acetate-based latex, said latex having a solids content of about 50% and having a pH of not less than about 4.5, the sealant having from about 10 to 25% water, and having from about 25 to 45% of a particulate filler, which is finer than 200 mesh British Standard, the coke oven door sealant having from about 5 to 15% of an inorganic fiber, at least about 40% of which fiber will pass through a 100 mesh British Standard sieve, the sealant composition further comprising from about 0.5 to about 5% of a blowing agent which decomposes in the temperature range from about 140° to 225° C. to give off a gas, the blowing agent tending to counteract any shrinkage tendency of the coke oven door sealant being effective as a sealant against gas leakage during a cycle of use, with any shrinkage tendency of the coke oven door sealant being counteracted by the blowing agent, for several hours at temperatures of up to about 200° C. and the coke oven door sealant being effective as a gas sealant and remaining flexible at temperatures of up to about 80° C. for several months.

4,277,569

FIRE-RETARDANT FOAM

Benjamin M. Walker, Madison, Conn., assignor to Sentinel Foam Products Incorporated, Hyannis, Mass.

Filed Mar. 10, 1980, Ser. No. 129,117

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—92 **7 Claims**

1. A low density fire-retardant foam comprising a foamed blend of a polyolefin polymer, an antimony oxide and a halogenated wax wherein the ratio of said halogenated wax to said antimony oxide is from about 7:1 to 9:1 by weight.

4,277,570

METHOD OF PRODUCING CROSS-LINKED, UNSATURATED POLYESTERS

Joseph P. Michel, Anglet, France, assignor to Martine Anciaux widow Wastesaeger, Anglet, France, a part interest

Division of Ser. No. 943,332, Sep. 18, 1978. This application Apr. 3, 1980, Ser. No. 136,993

Claims priority, application France, Sep. 28, 1977, 77 29123

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—106 **7 Claims**

1. A method of producing a cured foamed product from a solution of a linear unsaturated polyester in a cross-linking agent, said method comprising the step of contacting a reaction medium comprising said solution and a free radical initiator and containing free hydroxyl radicals at room temperature and under atmospheric pressure, with at least one foaming agent and with at least one totally hydrolyzable chlorine-containing derivative in an amount from 1 to 10% by weight, based on said solution, said chlorine-containing derivative comprising at least one member selected from the group consisting of phosphorous chloride, phosphorous oxychloride, silicon chloride, and an acid chloride selected from acetyl chloride and benzoyl chloride, whereby said method produces said cured foamed product in a one-stage process without the external application of heat.

4,277,571

URETHANE GROUP-CONTAINING POLYISOCYANURATE FOAM BASED ON NAPHTHENIC ACID-HYDROXYLAMINE ADDUCT

Georg Falkenstein, Neustadt, and Hansjuergen Kessler, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 21, 1980, Ser. No. 135,587

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1979, 2915468

Int. Cl.³ C08G *18/14*, *18/32*

U.S. Cl. 521—164 **10 Claims**

1. A process of making a urethane-group containing polyisocyanurate foam from organic polyisocyanate, a polyhydroxy compound, a blowing agent, a catalyst, wherein the polyhydroxy compound is a reaction mixture of a hydroxyl group containing amine which is at least difunctional and is selected from the group consisting of a secondary amine, a tertiary amine and a mixture thereof, and a naphthenic acid, said reaction mixture brought to reaction at a temperature of 0° C. to 150° C. in such quantity that 0.3 equivalent to 50 equivalents of secondary and/or tertiary amino group from the hy-

droxyl group-containing amine is present per carboxylic equivalent of the naphthenic acid.

4,277,572

GALVANIC CELL SEPARATOR

Kunihiko Fujiwara; Kazuya Osawa, both of Yokohama; Yoshiteru Takeda, Tokyo, and Toshiaki Yabumoto, Yokohama, all of Japan, assignors to The Furukawa Electric Company, Ltd., Tokyo and The Furukawa Battery Co., Yokohama, both of, Japan

Division of Ser. No. 911,529, Jun. 1, 1978, abandoned. This application Aug. 13, 1979, Ser. No. 66,062

Claims priority, application Japan, Jun. 3, 1977, 52/65582; Feb. 24, 1978, 53/19746; Mar. 7, 1978, 53/24945

Int. Cl.³ C08F *8/06*

U.S. Cl. 525—61 **5 Claims**

1. A method for manufacturing a galvanic cell separator which comprises the steps of

(a) heating a polyvinyl alcohol film until the polyvinyl alcohol has a crystallinity of at least 0.4 and subsequently

(b) contacting the surface of said polyvinyl alcohol film with an aqueous solution of permanganate.

4,277,573

VINYL CHLORIDE RESIN AND ALKYL METHACRYLATE RESIN PROCESSING AID COMPOSITION

Yo Iizuka, Iwaki, Japan; Susumu Midorikawa, deceased, late of Iwaki, Japan (by Taeko Midorikawa, heir); Kiyoshi Midorikawa, heir, and Yumi Midorikawa, heir, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaishi, Tokyo, Japan

Filed Oct. 17, 1979, Ser. No. 85,519

Claims priority, application Japan, Oct. 17, 1978, 53-127693

Int. Cl.³ C08L *27/06, 33/10, 33/12, 51/06*

U.S. Cl. 525—85 **10 Claims**

1. A vinyl chloride resin composition comprising:

(1) 100 parts of a vinyl chloride polymer; and

(2) 0.1 to 30 parts of a polymer processing aid comprising:

(A) 40 to 90 parts of a copolymer comprising

80 to 100% of an alkyl methacrylate, and

0 to 20% of a monomer copolymerizable therewith; and

(B) 60 to 10 parts of a copolymer comprising

20 to 79% of an alkyl methacrylate,

20 to 79% of an aromatic vinyl monomer,

1 to 49% of a diolefin, and

0 to 20% of a monomer copolymerizable therewith,

100 parts of said polymer processing aid having been obtained by polymerizing 60 to 10 parts of the constituent monomers of the copolymer (B) in the presence of 40 to 90 parts of the copolymer (A), all quantities expressed in parts and percentages being by weight.

4,277,574

PROCESS FOR PREPARING ABS POLYBLENDS

Michael B. Jastrzebski, Ware, and Allen R. Padwa, Westfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1979, Ser. No. 95,708

Int. Cl.³ C08L *9/00, 147/00, 47/00*

U.S. Cl. 525—86 **19 Claims**

1. A continuous mass polymerization process for preparing an ABS polyblend having a bimodal rubber particle size distribution, the steps comprising:

(A) continuously charging a monomer formulation of alkenyl aromatic and alkenyl nitrile monomers having a soluble diene rubber dissolved therein and first grafted diene rubber particles dispersed therein to a reaction zone, said grafted rubber having alkenyl aromatic and alkenyl nitrile grafts, said first grafted rubber particles having an average particle size of about 0.01 to 0.5 microns,

(B) continuously mass polymerizing said charged monomer formulation in said reaction zone, to a conversion of about 30 to 80%, while forming and dispersing said soluble diene rubber as second grafted diene rubber particles having present occluded and grafted polymers of said monomers in amount of about 0.5 to 5.0 parts per part of rubber, said second grafted diene rubber particles having an average particle size of about 0.7 to 10.0 microns, said monomers forming a copolymer of said monomers as a matrix phase polymer having said first and second rubber particles dispersed therein,

(C) continuously removing an effluent from said reaction zone at a rate essentially equal to that of said charged monomer formulation, and

(D) separating said matrix polymer having said first and second grafted rubber particles dispersed therein from said effluent as said ABS polyblend having a bimodal rubber particle size distribution,

wherein the weight ratio of alkenyl aromatic to alkenyl nitrile monomers in said monomer formulation is about 85:15 to 60:40; wherein said soluble rubber moiety and said first grafted rubber moiety are present in said monomer formulation in a total amount of about 2 to 40 percent by weight with said soluble rubber moiety being about 5 to 50 percent by weight of the total rubber moiety; wherein the polymerization of step (B) is conducted at temperatures of about 90° to 180° C. under a pressure of about 5 to 150 psia with shearing agitation; wherein said diene rubbers are polybutadiene based rubbers.

4,277,575

IMPACT MODIFIER FOR THERMOPLASTIC COMPOSITIONS

William R. Haaf, Voorheesville, and Charles P. Shank, Averill Park, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 2, 1979, Ser. No. 81,125

Int. Cl.³ C08L *53/00*

U.S. Cl. 525—89 **7 Claims**

1. In a thermoplastic composition comprising polyphenylene oxide and styrene resin, the improvement which comprises an impact strength improving amount of an impact modifier consisting essentially of an admixture of a diblock copolymer of polystyrene/saturated rubber with a triblock copolymer of polystyrene/ethylene-butylene rubber/polystyrene, wherein the diblock and triblock copolymers are in a weight ratio of di- to tri- form 1:1 to 1:4 and diblock constitutes from 1 to 50% of the diblock-triblock mixture.

4,277,576

PREPARATION OF MODIFIED POLYMERS OF N-VINYLPYRROLID-2-ONE AND THEIR USE FOR THE PREPARATION OF POLYMERS INTERRUPTED BY BRIDGE MEMBERS

Ferdinand Straub, Hockenheim; Herbert Spoor, Limburgerhof, and Claus Cordes, Weisenheim am Berg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 56,136, Jul. 9, 1979. This application Feb. 26, 1980, Ser. No. 124,708

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831355

Int. Cl.³ C08F *8/04*

U.S. Cl. 525—123 **2 Claims**

1. A process for the preparation of a linear N-vinylpyrrolid-2-one polymer of increased molecular weight and which contains ester groups or urethane groups as bridge members wherein (1) a poly-N-vinylpyrrolidone obtained by a process in which a polymer obtained by the free radical polymerization of N-vinylpyrrolid-2-one in the presence of hydrogen peroxide as the free radical initiator is treated with a complex hydride to form a polymer having two identical reactive end groups is cooled and then reacted with (2) a bifunctional compound which contains reactive groups and which is selected from the group consisting of phosgene, oxalyl chloride, malonyl chlo-

ride, succinyl chloride, glutaric acid dichloride, sebacic acid dichloride, phthalic acid dichloride, terephthalic acid dichloride, toluylene diisocyanate, hexamthylene diisocyanate and methylene-bis-cyclohexyl diisocyanate.

4,277,577

THERMOPLASTIC MOLDING COMPOSITIONS ON THE BASIS OF OXYMETHYLENE POLYMERS

Karlheinz Burg, Wiesbaden; Werner Schmieder, Kelkheim, and Ernst Wolters, Konigstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,292

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1978, 2818240

Int. Cl.³ C08L *59/02, 59/04*

U.S. Cl. 525—154 **6 Claims**

1. Molding composition consisting essentially of a mixture of

(A) from 99.89 to 60 weight % of an oxymethylene polymer;

(B) from 0.1 to 40 weight % of an elastomer having a softening temperature of below the crystallite melting point of the oxymethylene polymer according to (A) and a second order transition temperature of from −120° to +30° C.; and

(C) from 0.01 to 20 weight % of a segmented thermoplastic copolyester.

4,277,578

COMPOSITION FOR DRAWN FILM, COLD DRAWN FILM MADE OF SAID COMPOSITION AND PROCESS FOR MANUFACTURE OF SAID FILM

Isao Yoshimura; Hideo Hata, and Takashi Kaneko, all of Kawaski, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Oct. 6, 1978, Ser. No. 949,253

Claims priority, application Japan, Oct. 11, 1977, 52-120917; Nov. 22, 1977, 52-139431; May 30, 1978, 53-63870; May 30, 1978, 53-63872

Int. Cl.³ C08L *23/04, 23/06, 23/08, 23/16*

U.S. Cl. 525—211 **20 Claims**

1. A cold drawn film having a tensile strength of not less than 5.0 kg/mm^2 and a Haze of not more than 4.0%, which film comprises a homogeneous blend of the combination of components (A), (B) and (C), wherein

(A) is at least one selected from the group consisting of copolymers of ethylene with vinyl ester monomers, unsaturated aliphatic monocarboxylic acids and alkyl esters of said monocarboxylic acids which are all copolymerizable with ethylene,

(B) is an elastomer having a density of not more than 0.91 g/cm^3 and made of an ethylene-α-olefin copolymer, and

(C) is at least one selected from the group consisting of crystalline polypropylene, high-density polyethylene and crystalline polybutene-1, wherein the components of the composition are in amounts such as to satisfy $0.90 \geqq B/(A+B) \geqq 0.05$ and $0.05 \leqq C/(A+B) \leqq 2.0$ in terms of weight ratio.

4,277,579

INCREASING THE MOLECULAR WEIGHT OF A CHLORINATED POLYMER OF ETHYLENE BY TREATMENT WITH A SULFUR COMPOUND EITHER BEFORE OR DURING CHLORINATION OF SAID POLYMER

Manfred Beck, Odenthal-Hahnenberg, and Wilhelm Göbel, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 55,383

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830556

Int. Cl.³ C08F *8/20*

U.S. Cl. 525—344 **5 Claims**

1. A process for increasing the molecular weight of a chlorinated elastomer obtained by the chlorination of a polymeric hydrocarbon with a chlorinating agent, said polymeric hydrocarbon being selected from the group consisting of low and high density homopolymers of ethylene, copolymers of ethylene and vinyl acetate having a vinyl acetate content of up to 80% by weight, copolymers of ethylene and propylene, copolymers of ethylene and butene and terpolymers of ethylene, propylene and an unconjugated diene and said process comprising adding at least one compound selected from the group consisting of disulphur dichloride, disulphur dibromide, sulphur dichloride, sulphur dibromide, thionyl chloride and thionyl bromide to said elastomer, either before or during chlorination, in a quantity of from 0.01 to 5 parts by weight per 100 parts by weight of elastomer.

4,277,580

TERPOLYMER OF N-VINYL PYRROLIDONE IN ALKOXYLATED FORM

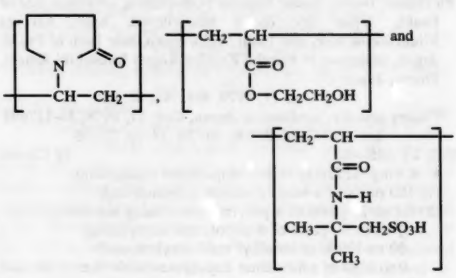
Joseph C. Allen, Bellaire, and Jack F. Tate, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 908,174, May 22, 1978, Pat. No. 4,219,429. This application Oct. 15, 1979, Ser. No. 84,698

Int. Cl.³ C08F *8/00, 226/10*

U.S. Cl. 525—383 **2 Claims**

1. A water-soluble terpolymer consisting of repeating units of:



alkoxylated with about 2 to about 100 weight percent of a substance selected from the group consisting of ethylene oxide and a mixture of ethylene oxide and propylene oxide wherein in the said mixture the weight percent of ethylene oxide ranges from about 60 to about 95, wherein in the said terpolymer the weight percent of vinylpyrrolidone units is from about 65 to about 80, the weight percent of hydroxyethyl acrylate units is from about 8 to about 15 with the balance being 2-acrylamido-2-methylpropane sulfonic acid units and wherein the number average molecular weight of the said terpolymer is from about 10,000 to about 2,000,000.

4,277,581

POLYAMINO-POLYAMIDE CROSSLINKED WITH CROSSLINKING AGENT

Guy Vanlerberghe, Claye-Souilly; Henri Sebag, Paris; Jean-Francois Grollier, Paris, and Alexandre Zysman, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 881,513, Feb. 2, 1978, Pat. No. 4,189,468, which is a continuation-in-part of Ser. No. 762,804, Jan. 26, 1977, Pat. No. 4,172,887, which is a continuation of Ser. No. 528,577, Nov. 29, 1974, abandoned. This application Jul. 16, 1979, Ser. No. 57,684

Claims priority, application Luxembourg, Nov. 30, 1973, 68901; France, Mar. 2, 1977, 77 06031

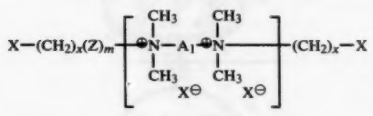
Int. Cl.³ C08G *69/48*

U.S. Cl. 525—420 **38 Claims**

1. A crosslinked polymer, which is soluble in water at 10 weight percent thereof without gel formation, obtained by

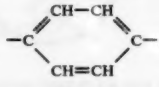
crosslinking a polyamino-polyamide with a crosslinking agent wherein said crosslinking agent is employed in an amount of 0.025 to 0.35 mole per amine group of said polyamino-polyamide, said polyamino-polyamide being prepared by the polycondensation of (a) an acidic compound selected from the group consisting of (i) an acid selected from the group consistintg of an organic saturated dicarboxylic acid having from 6 to 10 carbon atoms and terephthalic acid, (ii) the addition compound of one mole of an alkylenediamine with two moles of an unsaturated acid selected from the group consisting of acrylic acid, methacrylic acid and itaconic acid, (iii) an ester of said compounds of (i) and (ii) with a lower alkanol having 1–6 carbon atoms and (iv) mixtures of (i), (ii) and (iii) on (b) a polyamine selected from the group consisting of bis-primary mono-secondary polyalkylene polyamine and bis-primary bis-secondary polyalkylene polyamine, said polyamine (b) being replaceable by a member selected from the group consisting of (1) up to 20 mole percent hexamethylene diamine, (2) up to 40 mole percent bis-primary amine and (3) up to 40 mole percent bis-secondary amine, said crosslinking agent being selected from the group consisting of:

(I) simple bi-functional compounds selected from the group consisting of (1) bis-halohydrins resulting from the reaction of an epihalohydrin with a primary amine, a bis-secondary diamine, a bis-phenol or a bis-mercaptan, (2) a bis-azetidinium derived from N,N-dialkyl halogeno hydroxy propylamine by cyclization or from bis-halohydrin for which the halohydrin units are linked to the remainder of the molecule by tertiary nitrogen groups, and carry two azetidinium groups or one azetidinium group and one halohydrin group, (3) a bis-haloacyl diamine, and (4) an alkyl bis-halide of the formula



(F1)

wherein X=Cl or Br, Z represents



x=1 to 3, m=0 or 1, n=0 or 1, m and n do not represent 1 at the same time, with the proviso that when m=1, x=1, A_1 represents a saturated divalent hydrocarbon radical having 2,3,4 or 6 carbon atoms or 2-hydroxyl propylene;

(II) an oligomer obtained by the reaction of compound (a) selected from the group consisting of compounds (1), (2), (3) and (4), each defined above, (5) an epihalohydrin, (6) a bis-epoxide and (7) a bis-unsaturated derivative, with a compound (b) which is a bi-functional compound reactive with said compound (a), said compound (b) being selected from the group consisting of primary amine, a bis-secondary diamine, a bis-mercaptan and a bis-phenol, the molar ratio of (b):(a) being between 0.1 and 0.9;

(II-bis) an oligomer obtained by the reaction of compound (a_1) selected from the group consisting of compounds (1), (3), (4) and (6) each defined above, with a bis-tertiary diamine (b_1) which is a bi-functional compound reactive with said compound (a_1), the molar ratio of (b_1):(a_1) being between 0.1 and 0.9;

(III) the quaternization product of compound (a_2) selected from the group consisting of (1) a bis-halohydrin resulting from the reaction of an epihalohydrin with piperizine, a bis-phenol or a bis-mercaptan; (2) a bis-azetidinum, defined above in (I) (2), (3) a bis-haloacyl diamine, (4) an alkyl bis-halide of formula F_1 above, (6) a bis-epoxide, (7) a bis-unsaturated derivative, (8) an oligomer II obtained by the reaction of compound (a_3) selected from the group consisting of compounds (1), (2), (3), (4), (6) and (7) each defined above with a compound (b_3) which is a bi-functional compound reactive with said compound (a_3), said compound (b_3) being selected from the group consisting of a primary amine, a bis-secondary diamine, a bis-mercaptan and a bis-phenol, the molar ratio of (b_3):(a_3) being between 0.1 and 0.9; (9) an oligomer obtained by the reaction of an epihalohydrin (a_4) with a compound (b_4) which is a bi-functional compound reactive with said compound (a_4), said compound (b_4) being selected from the group consisting of piperazine, a bis-mercaptan, a bis-phenol and a bis-epoxide of piperazine, the molar ratio of (b_4):(a_4) being between 0.1 and 0.9, and (10) an oligomer obtained by the reaction of a compound (a_5) selected from the group consisting of (1) a bis-halohydrin resulting from the reaction of an epihalohydrin with piperazine, a bis-phenol or a bis-mercaptan, (2) a bis-halocyl diamine, (3) an alkyl bis-halide of formula F_1 above and (4) a bis-epoxide, with a compound (b_5), said compound (b_5) being a bis-tertiary diamine, the molar ratio (b_5):(a_5) being between 0.1 and 0.9; and

said product having a tertiary amine group alkylated with an alkylating agent (c) selected from the group consisting of methyl or ethyl chloride, bromide, iodide, sulfate, mesylate and tosylate, benzyl chloride or bromide, ethylene oxide, propylene oxide and glycidol.

4,277,582

WATER-INSOLUBLE HYDROPHILIC COPOLYMERS

Karl F. Mueller, New York, and William R. Good, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 883,022, Mar. 3, 1978, Pat. No. 4,192,827, which is a continuation of Ser. No. 581,065, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 483,743, Jun. 27, 1974, abandoned. This application Jun. 22, 1979, Ser. No. 51,337

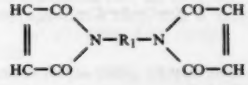
Int. Cl.[3] **F08G** *73/12;* **C08L** *79/08*

U.S. Cl. 525—421 **16 Claims**

1. A water-insoluble hydrophilic gel comprising the crosslinked copolymerization product of

(A) about 30 to about 90% by weight of said gel of (a) a water-soluble monoolefinic monomer, or mixture of said monomers, or (b) a water-soluble monomer, or mixture of said monomers, with 1 to 50% by weight of total monomers of a water-insoluble monoolefinic monomer, or mixture of said water-insolulbe monomers, with

(B) about 10 to about 70% by weight of said gel of a terminal diolefinic hydrophilic macromer having a molecular weight from about 400 to about 8000, said monomer having the formula



wherein R_1 is a polycondensate chain having a molecular weight from about 200 to about 8000, which is the residue of a poly(propylene oxide) or poly(tetramethylene oxide) glycol having ether linkages.

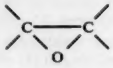
4,277,583

OXIRANE POLYIMIDE COPOLYMERS

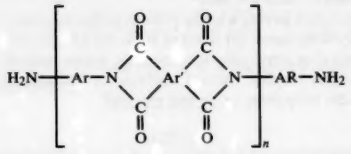
Phillip A. Waitkus, and Bohumir Lepeska, both of Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Filed Dec. 3, 1979, Ser. No. 99,426
Int. Cl.[3] C08L 63/00, 77/06
U.S. Cl. 525—423 29 Claims

1. The process of copolymerizing a polyoxirane compound having at least two



moieties, wherein the unoccupied valencies are attached to carbon or hydrogen atoms and a m-cresol soluble amino-terminated polyimide having the formula:



wherein Ar' is a tetravalent aromatic organic radical in which the four carbonyl groups attached thereto are attached directly to separate carbon atoms and each pair of carbonyl groups are attached to adjacent carbon atoms in the Ar' radical except that when Ar' represents the naphthalene radical, one or both pairs of carbonyl groups may be attached to the peri carbon atoms; Ar is a divalent aromatic radical; and n is an integer of at least one; the proportions of said polyoxirane compound and said polyimide being such as to provide at least one oxirane group for each amine group; and said copolymerization being effected at a temperature in the range of 80°–380° C.

4,277,584

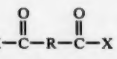
ANTISTATIC AGENTS, SYNTHESIS AND USE THEREOF

Sam Kwon Choi, and Kee Dong Lee, both of Seoul, Rep. of Korea, assignors to Sunkyong Fibers, Ltd., Rep. of Korea

Division of Ser. No. 957,213, Nov. 2, 1978, Pat. No. 4,211,859.
This application Jan. 14, 1980, Ser. No. 112,064
Claims priority, application Rep. of Korea, Nov. 16, 1977, 77-2682[U]
Int. Cl.[3] C08G 63/76; C08F 283/00; C08L 67/00
U.S. Cl. 525—437 2 Claims

1. A process for the manufacture of an antistatic agent useful for the manufacture of an antistatic polyester fiber which comprises:

(i) reacting about one mole of a dimetallic compound selected from the group consisting of compounds of Be, Mg, Ca, Sr, Ba, Zn and Cd and about two moles of same or different acyl compounds having the structural formula of:



wherein

(1) X's, which may be either identical or different, are selected from the group consisting of

(a) HO—,

(b) NH_2—,

(c) $OHSO_3$—and

(d) Cl—, Br—, or I—;

(2) R is selected from the group consisting of

(a)—$(CH_2)_n$—,

wherein n is an integer ranging from 1 to 8,

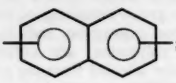
(b)—$(HC{=}CH)_k$—,

wherein k is either 1 or 2,

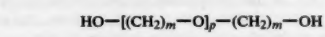
(c)—(C≡C)—,

(d)

(e)



(ii) reacting the product formed in step (i) above with a polyalkylene glycol having the structural formula of



where p is a number ranging from about 10 to about 1,500 and m is either 2 or 3.

4,277,585

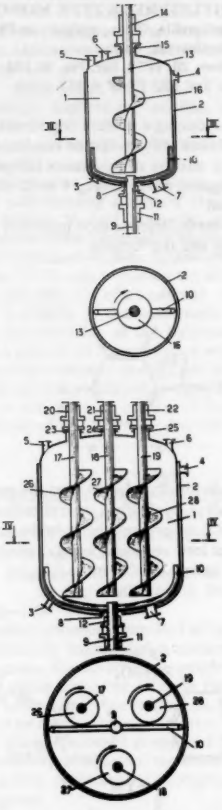
VERTICAL AUTOCLAVE FOR BULK POLYMERIZATION OF VINYL CHLORIDE

Francis Fournel, Chauny, and Salomon Soussan, St. Fons, both of France, assignors to Rhone-Progil, Courbevoie, France

Continuation of Ser. No. 823,338, Aug. 10, 1977, abandoned, which is a division of Ser. No. 442,372, Feb. 14, 1974, abandoned.
This application Apr. 23, 1979, Ser. No. 32,543
Claims priority, application France, Feb. 16, 1973, 73.05537
Int. Cl.[3] C08F 2/02, 14/06
U.S. Cl. 526—65 4 Claims

1. A process for bulk preparation of vinyl chloride polymers or copolymers insoluble in the initial monomeric composition which comprises prepolymerizing a composition based on vinyl chloride until a conversion of 7–15% of monomeric composition is achieved and a fluid prepolymerized medium is thus obtained, transferring the prepolymerized medium into a vertical autoclave, subjecting the prepolymerized medium to final polymerization in the vertical autoclave during which the medium converts from a fluid phase to a solid powdered phase, maintaining the fluid phase and the solid powdered phase upon conversion under continuous agitation during the final polymerization in the vertical autoclave by (a) subjecting the medium to agitation with a helicoidal ribbon that extends downwardly into the autoclave for rotation about a vertical axis, (b) concurrently subjecting the medium to agitation with at least one arm having a profile close to the base of the autoclave and

which moves across the bottom portion of the autoclave below the helicoidal ribbon during rotational movement about a



vertical axis, and rotating the one agitator independently of the other.

4,277,586

PROCESS FOR PREPARING A PROPYLENE-TETRAFLUOROETHYLENE COPOLYMER

Hiroshi Ukihashi, Tokyo; Masaaki Yamabe, Machida, and Hiroaki Kojima, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 525,648, Nov. 20, 1974, abandoned. This application Jan. 27, 1977, Ser. No. 763,136

Int. Cl.³ C08F *2/26, 214/26*

U.S. Cl. 526—93 **9 Claims**

1. In a process for the preparation of a stable dispersion of a propylene and tetrafluoroethylene copolymer of molecular weight 80,000–300,000 and a Mooney viscosity (ML_{1+10}, 100° C.) of 40–150 in which propylene and tetrafluoroethylene are copolymerized while dispersed in an aqueous medium, the improvement which comprises:

copolymerizing said propylene and tetrafluoroethylene at 10°–45° C. in the presence of a catalyst system comprising (1) a water soluble inorganic persulfate, (2) a water soluble thiosulfate or bisulfite and (3) a water soluble iron salt, the molar ratio of said water soluble inorganic persulfate/water soluble thiosulfate or bisulfite/water soluble iron salt being 0.1–2.0/1.0/0.005–0.5.

4,277,587

SULFIDING AND REOXIDATION OF CHROMIUM CATALYST

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 857,556, Dec. 5, 1977, Pat. No. 4,177,162. This application Jul. 10, 1979, Ser. No. 56,378

Int. Cl.³ C08F *4/22, 10/02*

U.S. Cl. 526—106 **37 Claims**

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule under polymerization conditions with an oxidized chromium-containing catalyst prepared by a process comprising a first step wherein a composition comprising a chromium component on a silica-containing base is contacted with an organic sulfur-containing ambient at a temperature of at least 370° C., chromium of said chromium component being at least partially in the hexavalent state and a subsequent second step wherein the thus treated composition is contacted with an oxygen-containing oxidizing ambient at a temperature within the range of 350°–900° C. to produce said oxidized chromium-containing catalyst

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4,277,588

PREPARATION OF ACETYLENE COPOLYMERS

Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal; Helmut Doerfel, Heidelberg, and Albrecht Eckell, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 129,828

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912572

Int. Cl.³ C08F *4/64, 4/68, 38/02, 38/04*

U.S. Cl. 526—114 **4 Claims**

1. A process for the preparation of acetylene copolymers by the catalytic polymerization of a mixture of (a) acetylene and (b) dialkynes or polyalkynes with a Ziegler catalyst, wherein

(1) the Ziegler catalyst is prepared from an aluminum-trialkyl and a titanium tetraoxyalkyl in a molar ratio of from 0.5:1 to 1:0.5,

(2) the weight ratio of the mixture to be polymerized to the Ziegler catalyst is from 100:0.1 to 100:10,

(3) the polymerization is carried out at from −90° to +100° C. and from 0.1 to 500 bar,

(4) the dialkynes or polyalkynes are selected from the group consisting of butadiyne, hexadiyne, octadiyne, diethynylbenzene, 1,3,5-triethynylbenzene, 1,2,4-triethynylbenzene and 1,3,5-tris-propyn-1-yl-2,4,6-trimethylbenzene, and

(5) the mixture to be polymerized contains up to 50 mole% of dialkynes or polyalkynes.

4,277,589

COMPONENTS OF CATALYSTS USEFUL FOR THE POLYMERIZATION OF ALPHA-OLEFINS, AND CATALYSTS PREPARED THEREFROM

Umberto Giannini, Milan; Enrico Albizzati, Arona, and Sandro Parodi, Oleggio, all of Italy, assignors to Montedison S.p.A., Milan, Italy and Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 5,501, Jan. 22, 1979, abandoned, which is a division of Ser. No. 882,547, Aug. 8, 1977, Pat. No. 4,149,990. This application Dec. 21, 1979, Ser. No. 105,912

Claims priority, application Italy, Aug. 9, 1976, 26148 A/76

Int. Cl.³ C08F *4/02, 10/06*

U.S. Cl. 526—122 **1 Claim**

1. A process for polymerizing alpha-olefins containing at least three carbon atoms, mixtures of said alpha-olefins or mixtures thereof with ethylene, which process comprises conducting the polymerization in the presence of a catalyst comprising the product obtained by mixing the following components:

(A) an organometallic Al compound free of halogen atoms directly bound to Al and selected from the group consisting of Al-alkyl compounds, Al-alkyl-alkoxyl compounds and Al-alkyl hydrides;

(B) a hydrocarbyl eletron-donor in such amount that from 10% to 95% of the compound (a) is combined with the electron-donor compound; and

(C) a solid catalyst component obtained by reacting:

(a) a liquid Ti tetrahalide soluble in hydrocarbons;

(b) a product comprising a Mg dihalide obtained by decomposition of an adduct between a Mg dihalide and at least 0.5 moles per mole of Mg dihalide of an electron-donor compound selected from the group consisting of hydrocarbyl electron-donors, ammonia, $POCl_3$ and $PSCl_3$, the decomposition of the adduct being carried out with a substance capable of reacting with the electron-donor compound of the adduct and selected from the group consisting of organometallic compounds of metals of Groups I to III of the Mendelyeev Periodic Table, or of Si, and, when the electron-donor of the adduct contains active hydrogen atoms, also from the group consisting of halides of tetravalent Si, trihalides of Al and B and halides of Sn and Sb, said decomposition product being characterized in that, in its X-rays powder spectrum, instead of the maximum intenstiy line appearing in the normal Mg dihalide spectrum, a halo appears the intensity maximum of which is shifted with respect to said line; and

(c) a hydrocarbyl electron-donor free of active hydrogen atoms, which may also be reacted with (a) or combined with (b) before reacting (a) with (b), said solid catalyst component being further characterized in that not more than 20% by weight of the Ti compounds contained therein are soluble in $TiCl_4$ at 80° C.

4,277,590

POLYMERIZATION OF ALPHA-OLEFINS WITH NOVEL $T_nMR'_{3-n}$ COCATALYSTS

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 49,086, Jun. 18, 1979, Pat. No. 4,215,014, which is a continuation-in-part of Ser. No. 890,324, Mar. 28, 1979, abandoned. This application Feb. 15, 1980, Ser. No. 122,233

Int. Cl.³ C08F *4/62, 10/06*

U.S. Cl. 526—127 **1 Claim**

1. An improved process for the polymerization of C_2 to C_{20} monomers and mixtures thereof to solid homo-, co-, or terpolymers by contacting said monomers with a catalyst system including:

(a) a Group IVB to VIII transition metal halide;

(b) at least one alkyl metal cocatalyst having the formula $TnMR'_{3-n}$ wherein n=1 or 2, T is R_3DCH_2, D being selected from the group consisting of Si, Ge and Sn, M being selected from the group consisting of Al, Ga and In, R being a methyl or ethyl group and R′ is selected from the group consisting of C_1–C_8 primary alkyl or aralkyl groups including unhindered branched groups, a molar ratio of said alkyl metal cocatalyst to said transition metal halide being about 0.5:1 to about 50:1; and

(c) at least one Lewis base in sufficient amounts as long as said Lewis base does not cause excessive cleavage of metal-carbon bonds or loss of active sites.

4,277,591

PROCESS FOR PRODUCING RANDOM COPOLYMERS OF CONJUGATED DIENES AND ALPHA-METHYLSTYRENE TYPE MONOMERS

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 20, 1979, Ser. No. 96,108

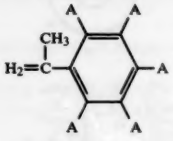
Int. Cl.³ C08F *4/56*

U.S. Cl. 526—174 **26 Claims**

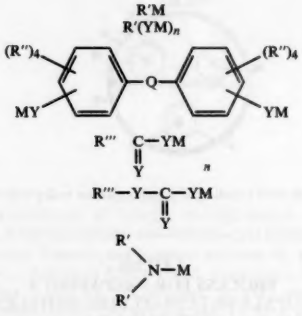
1. A process for producing a random copolymer comprising contacting under solution polymerization conditions in a polymerization zone (1) a mixture of monomers comprising

at least one conjugated diene having 4 to 12 carbon atoms per molecule and

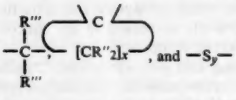
at least one alpha-methylstyrene type monomer having 9 to 24 carbon atoms and the formula



wherein each A is individually selected from the group consisting of hydrogen or alkyl, cycloalkyl, or aryl radicals having 1 to 8 carbon atoms, (2) an organolithium initiator, and (3) an effective amount of at least one alkali metal organic compound selected from those having the formulas:



wherein R′ is selected from the group consisting of aliphatic, cycloaliphatic, and aromatic radicals, M is an alkali metal selected from the group consisting of sodium, potassium, rubidium, and cesium, R″ is selected from the group consisting of aliphatic, cycloaliphatic, and aromatic radicals, Q is selected from the group consisting of



radicals wherein R″ is as defined before, x is 4 or 5, and y is 1, 2, or 3, R‴ is selected from the group consisting of aliphatic, cycloaliphatic, and aromatic radicals, Y is selected from the group consisting of oxygen and sulfur and n is 1, 2, or 3.

4,277,592
N-VINYLAMIDE POLYMERS AND PROCESS FOR THEIR MANUFACTURE USING TWO TYPES OF INITIATORS

Wilfried Eichhorn, Königstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,487

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829652

Int. Cl.³ C08F *22/38*

U.S. Cl. 526—227 **6 Claims**

1. In a process for the manufacture of an N-vinylamide polymer by polymerizing a tertiary N-vinyl-carboxylic acid amide, or a tertiary N-vinyl-carboxylic amide in combination with a copolymerizable olefinically unsaturated compound, in the presence of an inert aliphatic hydrocarbon at a temperature of from 0° to 150° C., the improvement which comprises polymerizing in the presence of an initiator which, under normal conditions, is soluble in the monomeric N-vinyl-carboxylic acid amide and insoluble in the hydrocarbon and which is present in an amount of from 0.1 to 4 weight percent, calculated on the total monomer amount, and an additional initiator which, under normal conditions, is soluble in the hydrocarbon and which is present in an amount of from 0.02 to 2 weight percent, calculated on the total monomer amount.

4,277,593
NOVEL POLYMERS BASED ON AZIDO AND SILANE MONOMERS

Bernard J. Scheve, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 10, 1979, Ser. No. 101,948

Int. Cl.³ C08F *226/02, 230/08*

U.S. Cl. 526—279 **6 Claims**

1. A coupling polymer comprised of (a) 20–80% by weight of an ethylenically unsaturated monomer containing at least one azide group; (b) 20–80% by weight of an ethylenically unsaturated silane monomer wherein the silicon molecule is substituted with at least one hydrolyzable radical; (c) 0–60% by weight of an ethylenically jnsaturated monomer containing no azide or silane functional group; and (d) 0–10% by weight of an ethylenically unsaturated monomer which is capable of absorbing actinic radiation and containing no azide or silane functional group.

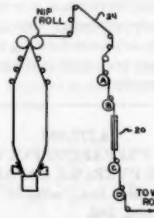
4,277,594
HEAT SHRINKABLE POLYETHYLENE FILM AND METHOD FOR ITS MANUFACTURE

Stephen B. Matthews; Tomas A. Loredo, both of Waynesboro; Walter H. Knox, III, and Herman F. Simmons, both of Harrisburg, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 23, 1979, Ser. No. 41,621

Int. Cl.³ C08F *110/02;* B29D *9/04, 7/24*

U.S. Cl. 526—352 **4 Claims**



1. A mildly biaxially oriented, blown polyethylene film characterized by a cross directional shrink force in the range of about 60 to 300 psi, an average heat seal energy of at least about 2.0 in-lbs., an average internal tear resistance of at least about 30 gms/ply, and a minimum shrink temperature no higher than 200° F. and which is less than the crystalline melt point (or points) of the polyethylene.

3. A process for producing a heat shrinkable biaxially oriented polyethylene film having a CD shrink force between about 60 and 300 psi and a MD shrink force of 200–300 psi, in accordance with a blown bubble method which comprises the sequential steps of (1) extruding as a continuous tube, molten polyethylene which has a crystalline melt point (or points) between about 220° F. and 270° F., (2) expanding the polyethylene tube cross-directionally at a blow ratio between about 3:1 and 8:1, (3) drawing the polyethylene film machine-directionally at a draw ratio between about 1.2:1 and 2.8:1 at a temperature between about 160° F. and 230° F., (4) drawing the polyethylene film cross-directionally at a draw ratio between about 1.2:1 and 2.5:1 at a temperature between about 160° F. and 230° F. but without applying additional heat, (5) relaxing the film so as to allow an MD shrink back between about 0.7:1 and 1.0:1, (6) heating the polyethylene film to a temperature between about 120° F. and 230° F. and (7) then drawing the polyethylene film machine directionally at a ratio between about 1.1:1 and 1.4:1 to achieve the desired finished film properties.

4,277,595
WATER ABSORBING CONTACT LENSES MADE FROM POLYSILOXANE/ACRYLIC ACID POLYMER

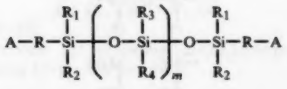
William G. Deichert, Macedon, N.Y.; Gregory C. Niu, Lexington, and Martin F. VanBuren, Chelmsford, both of Mass., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sep. 13, 1979, Ser. No. 74,944

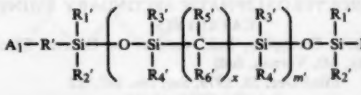
Int. Cl.³ C08G *77/14;* C08F *220/06*

U.S. Cl. 528—26 **24 Claims**

1. A soft, hydrophilic, water absorbing, flexible, fillerless, hydrolytically stable, biologically inert, transparent contact lens with the capability of transporting oxygen sufficiently to meet the requirements of the human cornea comprising a polysiloxane monomer α,ω terminally bonded through divalent hydrocarbon groups to polymerized, free radical, polymerizably activated, unsaturated groups copolymerized with acrylic acid forming a polymer in a crosslinked network capable upon saturation with water of retaining from about 1 percent to about 99 percent by weight, based on the total weight of the polymer, of water wherein the polysiloxane monomer is selected from the group consisting of a poly(organosiloxane) monomer having the formula

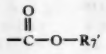


wherein A is an activated unsaturated group, R is a divalent hydrocarbon radical having from 1 to about 22 carbon atoms, R_1, R_2, R_3 and R_4 can be the same or different and are selected from the group consisting of a monovalent hydrocarbon radical or a halogen substituted monovalent hydrocarbon radical each having from 1 to 12 carbon atoms and m is from about 50 to about 800 and the polyparaffinsiloxane monomer having the formula

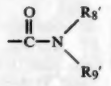


wherein A_1 is an activated unsaturated group; R' is a divalent hydrocarbon radical having from 1 to about 22 carbon atoms; R'_1, R'_2, R'_3 and R'_4 can be the same or different and are selected from the group consisting of a monovalent hydrocar-

bon radical having from 1 to about 12 carbon atoms and a halogen substituted monovalent hydrocarbon radical having from 1 to about 12 carbon atoms; R'_5 and R'_6 can be the same or different and are selected from the group consisting of hydrogen, a hydrocarbon radical containing from 1 to about 12 carbon atoms, a carboxylic acid group, a carboxylic acid ester group represented by the formula



wherein R'_7 is selected from the group consisting of a hydrocarbon group containing from 1 to about 12 carbon atoms and a carboxylic acid amide represented by the formula



wherein R'_8 and R'_9 can be the same or different and each is selected from the group consisting of hydrogen and a hydrocarbon group containing from 1 to about 12 carbon atoms; x is 2 or greater and m' is from about 20 to about 500.

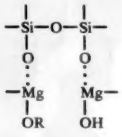
4,277,596

CALCINED POLYHYDROXYSILICATE POLYMER REACTION PRODUCT

Jean M. Lalancette, Sherbrooke, Canada, assignor to Societe Nationale de l'Amiante, Quebec, Canada

Filed Apr. 8, 1980, Ser. No. 138,451
Int. Cl.³ C08G *54/14, 8/28*
U.S. Cl. 528—106 **9 Claims**

1. A shaped structure formed from the reaction of a non fibrous calcined residue of chrysotile asbestos derived from chrysotile asbestos tailings having a particle size extending from fibrous to −325 mesh and a hydroxy-containing polymer selected from the group consisting of a phenol-formaldehyde polymer, a resorcinol-formaldehyde polymer, a phenol-resorcinol-formaldehyde polymer and an epoxy resin, said shaped structure being characterized by the total absence of any fibrous material, the new product representing a characteristic repeating magnesium oxide-resin bond of the formula:



wherein in R is the residue of said hydroxy-containing polymer, the amount of calcined residue of chrysotile asbestos tailings being from 5 to 90% by weight and the amount of polymer being from 90 to 5% by weight.

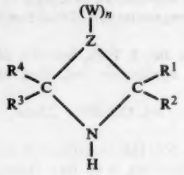
4,277,597

PROCESS FOR PREPARING POLYCARBONATES USING STERICALLY HINDERED HETEROCYCLOALIPHATIC SECONDARY AMINE CATALYSTS

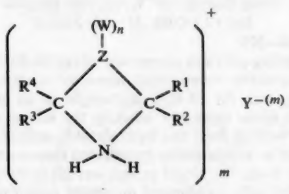
Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 28, 1979, Ser. No. 107,722
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—199 **7 Claims**

1. An interfacial polymerization process for preparing high molecular weight polycarbonates which comprise reacting, under interfacial polycarbonate-forming conditions, a dihydric phenol and a carbonate precursor in the presence of a catalytic amount of a compound selected from the group consisting of a secondary amine of the formula



wherein R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, alkaryl and aralkyl radicals, with the proviso that not more than 2 of R^1–R^4 are hydrogen; Z represents a divalent organic radical completing a 4 to 8 membered heterocycloaliphatic ring and containing from (1 to 5)−X carbon atoms and 0 to 1 atom selected from the group consisting of oxygen, nitrogen, and sulfur, wherein X is 0 or 1 and represents the number of oxygen, nitrogen or sulfur atoms present in Z, with the proviso that Z contains at least one carbon atom; each W is independently selected from the group consisting of cycloalkyl, hydroxyl, alkoxy and lower alkyl radicals; and n is an integer having a value from 0 to a maximum value equal to the number of replaceable hydrogens present in Z and an acid addition salt of the formula



wherein R^1, R^2, R^3, R^4, Z and $(W)_n$ are as described above; Y is a m valent anion and m is an integer having a value from 1 to 3 inclusive.

4,277,598

PROCESS FOR PREPARING POLYCARBONATES USING CYCLIC AMIDINE CATALYSTS

Walter L. Hall, Mt. Vernon; Donald B. G. Jaquiss, New Harmony, and Victor Mark, Evansville, all of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 28, 1979, Ser. No. 107,726
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—199 **16 Claims**

1. An interfacial polymerization process for preparing high molecular weight polycarbonates which comprises reacting, under interfacial polycarbonate-forming conditions, a dihydric phenol and a carbonate precursor in the presence of a catalytic amount of a cyclic amidine.

4,277,599

PROCESS FOR PREPARING POLYCARBONATES USING PYRROLE CATALYSTS

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 28, 1979, Ser. No. 107,728
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—199 **11 Claims**

1. An interfacial polymerization process for preparing a high molecular weight aromatic polycarbonate which comprises

reacting, under interfacial polycarbonate-forming conditions, a dihydric phenol and a carbonate precursor in the presence of a catalytic amount of a compound selected from the group consisting of pyrroles and pyrrole salts.

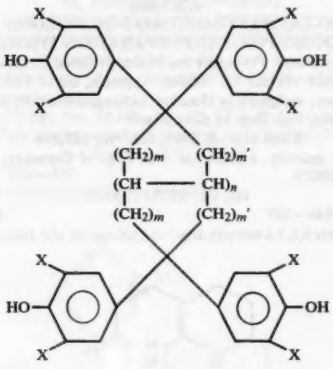
4,277,600

TETRAPHENOLIC COMPOUNDS AND POLYCARBONATES CONTAINING THE SAME

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Sep. 20, 1979, Ser. No. 76,973
Int. Cl.³ C08G *63/62*; C07C *39/15*
U.S. Cl. 528—204 **9 Claims**

1. A tetraphenolic compound of the formula



wherein each X substituent is independently selected from phenyl, H, Cl, Br, and C_1 to C_5 alkyl; each m and m′ are integers selected independently from 0, 1, 2 and 3; and n is an integer of either 0 or 1, with the proviso that the sum of all the m and m′ integers and n is at least 2, and with the further proviso that at least one of the m integers is greater than 0 and at least one of the m′ integers is greater than 0.

7. A high molecular weight, thermoplastic, randomly branched polycarbonate composition, said polycarbonate substantially free of crosslinking, based on a dihydric phenol, having an intrinsic viscosity of 0.40 to 1.00 dl/g in methylene chloride at 25° C., wherein the branching component is a compound of claim **1**.

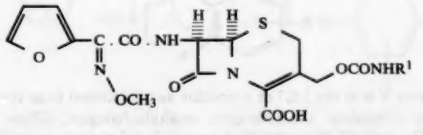
4,277,601

PREPARATION OF SODIUM CEFUROXIME

Eric Thompson, and Christopher J. Baalham, both of Ulverston, England, assignors to Glaxo Group Limited, England

Filed Feb. 14, 1980, Ser. No. 121,531
Claims priority, application United Kingdom, Feb. 15, 1979, 05456/79
Int. Cl.³ C07D *501/34*
U.S. Cl. 544—22 **7 Claims**

1. In a process for the preparation of sodium cefuroxime or a solvate thereof, the improvement which comprises subjecting a compound of formula



(I)

wherein R^1 is a base-labile group, to alcoholysis with a C_{1-4} alkanol, a C_{2-6} alkane glycol or a glycol having recurring units of 2 to 4 carbon atoms in a substantially anhydrous organic solvent medium in the presence of a basic catalyst soluble in the said medium, which basic catalyst comprises the sodium salt of C_{2-10} alkanoic acid having a pK_a value not less than 3.5.

7. Sodium cefuroxime tetrahydrofuran solvate.

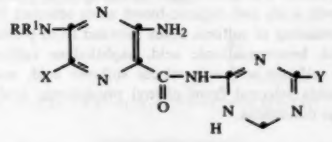
4,277,602

3-AMINO-5-SUBSTITUTED-6-HALO-N-(3,4-DIHYDRO-6-SUBSTITUTED-1,3,5-TRUAZIN-2-YL)2-PYRAZINECARBOXAMIDES

Otto W. Woltersdorf, Chalfont, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 2, 1980, Ser. No. 165,312
Int. Cl.³ C07D *251/10*
U.S. Cl. 544—207 **4 Claims**

1. A compound of the formula:



wherein

R is hydrogen, C_{1-5} alkyl, C_{2-5} alkenyl or C_{3-6} cycloalkyl;

R^1 is hydrogen, C_{1-5} alkyl, C_{2-5} alkenyl or C_{3-6} cycloalkyl;

X is halo;

Y is hydroxy

the pharmaceutically acceptable acid addition salts thereof and the tautomeric forms thereof

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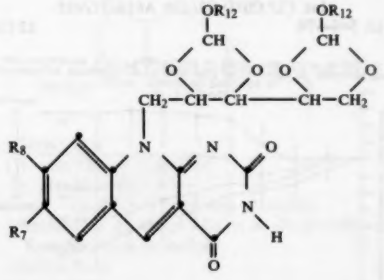
4,277,603

PREPARATION OF 5-DEAZARIBOFLAVINS

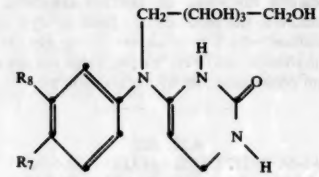
Richard L. Tolman, Warren; Wallace T. Ashton, Clark, and Ronald D. Brown, Cranford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 960,341, Nov. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 894,299, Apr. 7, 1978, abandoned, which is a continuation of Ser. No. 753,664, Dec. 22, 1976, abandoned. This application Mar. 12, 1979, Ser. No. 19,986
Int. Cl.³ C07D *471/04*
U.S. Cl. 544—250 **20 Claims**

1. The process for preparing di-O-alkoxymethylene-5-deazariboflavins having the structure:



wherein R_7 is H or methyl; R_8 is alkyl having 1 to 3 carbon atoms or hydroxy; R_{12} is alkyl having 1 to 2 carbon atoms which comprises cyclizing the uracil derivatives having the structure:



wherein R_7 and R_8 are as defined above, by treating said uracil derivatives with trialkylorthoformate having the structure:

$HC(OR_{12})_3$

wherein R_{12} is as defined above in the presence of a strong acid catalyst selected from the group consisting of strong mineral acids, selected from anhydrous hydrochloric acid, sulfuric acid, anhydrous phosphoric acid and anhydrous phosphorous acid, Lewis acids and organic-based acids selected from the group consisting of sulfonic acids selected from p-toluenesulfonic acid, benzenesulfonic acid, naphthalene sulfonic acid methane sulfonic acid and ethane sulfonic acid, and phosphonic acids selected from phenyl phosphonic acid, under anhydrous conditions.

4,277,604

FACILE SYNTHESIS OF CODEINE PRECURSORS FROM THEBAINE

William G. Dauben, Berkeley, Calif.; Craig P. Baskin, Avenel, N.J., and Herman C. H. A. vanRiel, Alphen aan den Rijn, Netherlands, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jan. 25, 1980, Ser. No. 115,411
Int. Cl.³ C07D *489/02*
U.S. Cl. 546—44 **7 Claims**

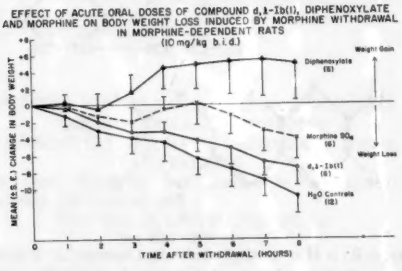
1. In a process for converting thebaine to a mixture of codeinone and neopinone in a solvent containing water and in the presence of a mercuric salt, the improvement wherein the solvent is up to about 5 N in formic acid and the amount of mercuric salt is 0.5–20 molar % with respect to thebaine.

4,277,605

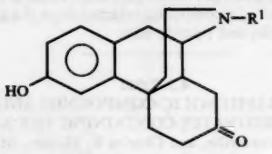
CHEMICAL COMPOUNDS

Joseph P. Buyniski, Syracuse, N.Y.; John W. Hooper, Pierrefonds, and Gary M. F. Lim, Candiac, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 7, 1980, Ser. No. 128,329
Int. Cl.³ C07D *221/28*; A61K *31/485*
U.S. Cl. 546—74 **12 Claims**


EFFECT OF ACUTE ORAL DOSES OF COMPOUND d,l-Ib(i), DIPHENOXYLATE AND MORPHINE ON BODY WEIGHT LOSS INDUCED BY MORPHINE WITHDRAWAL IN MORPHINE-DEPENDENT RATS
(10 mg/kg b.i.d.)
MEAN (±S.E.) CHANGE IN BODY WEIGHT
TIME AFTER WITHDRAWAL (HOURS)
Weight Gain
Weight Loss
Diphenoxylate (8)
Morphine SO4 (8)
d,l-Ib(i) (8)
H2O Controls (18)

1. A compound of the formula



I

wherein R^1 is hydrogen, (lower)alkyl, cyclopropylmethyl, cyclobutylmethyl, propargyl, allyl or 3,3-dimethylallyl, or a nontoxic pharmaceutically acceptable acid addition salt thereof.

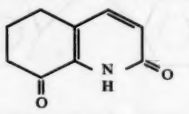
4,277,606

8-OXO-5,6,7,8-TETRAHYDRO-2-QUINOLONE AND PROCESS FOR THE PREPARATION THEREOF

Helmut Meidert, Frankfurt am Main; Wilfried Pressler, Kelkheim, and Werner H. Müller, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,566
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909035
Int. Cl.³ C07D *215/24*
U.S. Cl. 546—157 **6 Claims**

1. 8-Oxo-5,6,7,8-tetrahydro-2-quinolone of the formula



2. A process for the preparation of 8-oxo-5,6,7,8-tetrahydro-2-quinolone, which comprises hydrolyzing 8-chloro-5,6,7,8-tetrahydro-2-quinolone hydrochloride or 8-bromo-5,6,7,8-tetrahydro-2-quinolone hydrobromide with water at 50° to 100° C. to form the corresponding 8-hydroxy compound, subsequently neutralizing the aqueous solution, removing the water of crystallization from the 8-hydroxy-5,6,7,8-tetrahydro-2-quinolone trihydrate obtained, and dehydrogenating the anhydrous compound in a solvent with manganese dioxide to give 8-oxo-5,6,7,8-tetrahydro-2-quinolone.

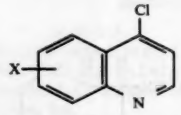
4,277,607

PROCESS FOR THE PREPARATION OF 4-CHLOROQUINOLINES

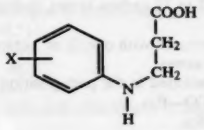
Jacques Bulidon, Paris, and Charles Pavan, Nogent-sur-Marne, both of France, assignors to Roussel Uclaf, Paris, France

Filed Sep. 15, 1978, Ser. No. 942,652
Claims priority, application France, Oct. 7, 1977, 77 30249
Int. Cl.³ C07D *215/18, 215/12, 215/20, 215/36*
U.S. Cl. 546—179 **7 Claims**

1. A process for the preparation of 4-chloro-quinolines of the formula



wherein X is in the 5,6,7 or 8-position and is selected from the group consisting of hydrogen, methyl, halogen, CF_3—, CF_3O— and CF_3S— consisting essentially of reacting an acid of the formula



with a chlorination agent selected from the group consisting of phosphorus oxychloride, phosphorus pentachloride and thionyl chloride in the presence of an oxidation agent selected from the group consisting of oxygen, iodine, cupric chloride and ferric chloride to form the desired compound.

4,277,608

METHOD OF PREPARING 4A-ARYLHEXAHYDRO-1H-2-PYRINDINES AND 4A-ARYLOCTAHYDROISOQUINOLINES

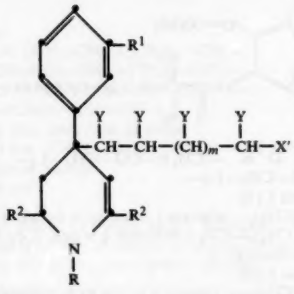
Dennis M. Zimmerman, Mooresville, and Roger L. Robey, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 50,940, Jun. 21, 1979, Pat. No. 4,236,009. This application Apr. 18, 1980, Ser. No. 141,753

Int. Cl.³ C07D *211/70*

U.S. Cl. 546—339 **1 Claim**

1. An intermediate of the formula



in which R is $(C_1–C_3)$alkyl, $(C_3–C_4)$cycloalkylmethyl, benzyl or phenethyl, R^1 is H or $(C_1–C_3)$alkyloxy, each R^2 and Y is independently H, CH_3 or C_2H_5, m is 0 or 1 and X′ is Cl, Br or I.

4,277,609

SYDNONE IMINES

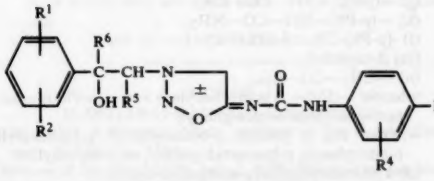
Reinhardt P. Stein, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 71,606, Aug. 31, 1979, abandoned. This application Jul. 29, 1980, Ser. No. 171,423

Int. Cl.³ A61K *31/42*; C07D *271/04*

U.S. Cl. 548—125 **15 Claims**

1. A compound of the formula:



in which the enantiomeric form is d,l or l- when R^5 is hydrogen, and d,l or l-threo when R^5 is other than hydrogen;

R^1 and R^2 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo or trifluoromethyl;

R^3 is hydrogen, halo, nitro or alkanoyl of 2 to 4 carbon atoms;

R^4 is hydrogen or halo;

R^5 and R^6 are, independently, hydrogen or methyl; or a non-toxic acid addition salt thereof.

4,277,610

SYNTHESIS OF 2,6,10-TRIMETHYL-UNDECAN-1-OL

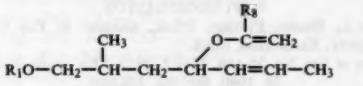
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 796,929, May 16, 1977, Pat. No. 4,107,183, which is a division of Ser. No. 638,722, Dec. 8, 1975, Pat. No. 4,041,058, which is a continuation-in-part of Ser. No. 544,154, Jan. 27, 1975, abandoned. This application May 12, 1978, Ser. No. 905,259

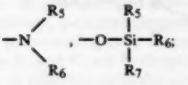
Int. Cl.³ C07F *7/08, 7/10, 7/18*

U.S. Cl. 556—446 **3 Claims**

1. A compound of the formula:



wherein R_1 taken together with its attached oxygen moiety forms an ether protecting group removable by acid catalyzed cleavage or hydrogenolysis; R_8 is hydrogen, lower alkoxy,



R_5, R_6 and R_7 are lower alkyl.

4,277,611

11-DEOXY-11-HYDROXYMETHYL-INTER-PHENYLENE-19-OXO-PGE$_1$ COMPOUNDS

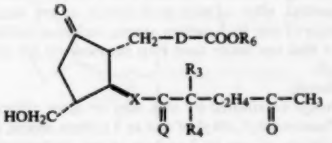
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,996

Int. Cl.³ C07C *177/00*

U.S. Cl. 560—53 **4 Claims**

1. A compound of the formula



wherein D is

(1) —(m-Ph)—$(CH_2)_2$—, or

(2) —(m-Ph)—O—CH_2—,

wherein —(m-Ph)— is inter-meta-phenylene;

wherein Q is α—OH:β—ι_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

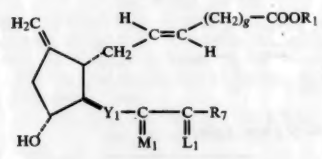
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CO_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is cis- or trans—CH=CH—.

4,277,612
ω-ARYL-9-DEOXY-9-METHYLENE-5,6-DIDEHYDRO-PGF_1 COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 35,144, May 1, 1979. This application Jan. 28, 1980, Ser. No. 116,080
Int. Cl.³ C07C *177/00*
U.S. Cl. 560—55 **5 Claims**

1. A prostaglandin analog of formula VI



VI

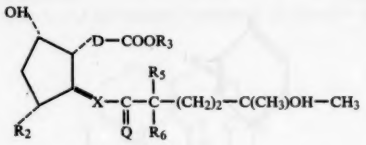
wherein Y_1 is trans—CH=CH—, —C≡C—, —CH_2CH_2—, or cis—CH=CH—;
wherein M_1 is α-R_5:β-OH or α-OH:R_5, wherein R_5 is hydrogen or methyl;
wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of β-R_3:β-R_4 and α-R_4:β-R_3 wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein g is 3, 4, or 5;
wherein R_7 is
(1) phenoxy;
(2) phenoxy substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(3) phenyl;
(4) phenyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(5) phenylmethyl, phenylethyl, or phenylpropyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that R_7 is phenoxy or substituted phenoxy only when R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein R_1 is
(a) hydrogen;
(b) alkyl of one to 12 carbon atoms, inclusive;
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(d) aralkyl of 7 to 12 carbon atoms, inclusive;
(e) phenyl;
(f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms;
(g) phenyl substituted in the para position by
(i) —NH—CO—R_{25}
(ii) —CO—R_{26}
(iii) —O—CO—R_{27}
(iv) —CH=N—NH—CO—NH_2
wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is hydroxy, methyl, phenyl, —NH_2, or methoxy; and R_{27} is phenyl or acetamidophenyl; inclusive, or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

4,277,613
19-HYDROXY-19-METHYL-6-OXO-PGF_1 INTERMEDIATES

John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507. This application Mar. 3, 1980, Ser. No. 126,504
Int. Cl.³ C07C *177/00*
U.S. Cl. 560—121 **1 Claim**

1. A prostacyclin-type compound of the formula



wherein D is —$(CH_2)_2$—CO—CH_2—L_2— or —CH=CH—CO—CH_2—L_3—;
wherein L_2 is
(1) —$(CH_2)_j$— wherein j is one to 4, inclusive,
(2) —$(CH_2)_q$—CF_2— wherein q is one, 2, or 3, or
(3) —CH=CH—,
wherein L_3 is
(1) —$(CH_2)_n$— wherein n is one to 5, inclusive,
(2) —$(CH_2)_p$—CF_2— wherein p is 2, 3, or 4, or
(3) —CH_2CH=CH—,
wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH, wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) -(p-Ph)-CH=N-NH-CO-NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{16},
wherein —(Ph)— is inter-phenylene and —(p-Ph) is inter-para-phenylene orpara-phenyl;
wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl,
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different,

with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and wherein X is
(1) trans-CH=CH-,
(2) cis-CH=CH-,
(3) —C≡C—, or
(4) $-CH_2CH_2-$,
and wherein ~ indicates attachment in alpha or beta configuration.

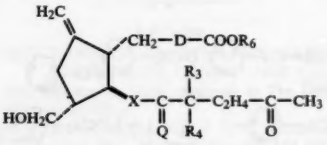
4,277,614

11-DEOXY-11-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-19-OXO-PGF$_2$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,206
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 560—121 **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—, or
(4) trans—$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is cis- or trans-CH=CH—.

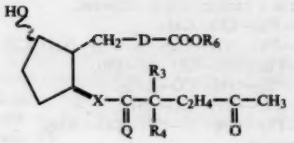
4,277,615

11-DEOXY-19-OXO-PGF$_2$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,207
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 560—121 **4 Claims**

1. A compound of the formula



wherein D is
cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is cis- or trans—CH=CH—.

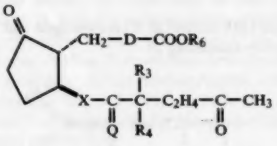
4,277,616

11-DEOXY-19-OXO-PGE$_2$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,208
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 560—121 **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—, or
(4) trans—$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m)β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is cis- or trans—CH=CH—.

4,277,617

PROCESS FOR THE PREPARATION OF ESTERS

Jacques Martel, Bondy; Jean Tessier, Vincennes; Jean-Pierre Demoute, Montreuil-sous-Bois, and Andre Teche, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

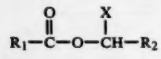
Filed Oct. 13, 1978, Ser. No. 951,184

Claims priority, application France, Oct. 27, 1977, 77 32414; Oct. 27, 1977, 77 32415; Jul. 24, 1978, 78 21811; Jul. 24, 1978, 78 21812

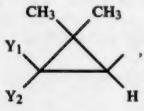
Int. Cl.³ C07C *69/74, 69/743*

U.S. Cl. 560—124 **1 Claim**

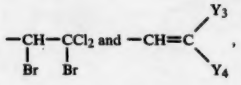
1. A process for the preparation of a compound of a stereoisomer of a compound of the formula



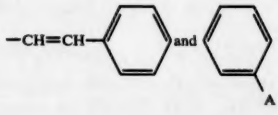
wherein R_1 is



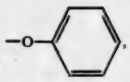
Y_1 and Y_2 are both methyl or Y_1 is hydrogen and Y_2 is selected from the group consisting of



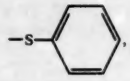
Y_3 and Y_4 are individually selected from the group consisting of fluorine, chlorine, bromine, hydrogen, and methyl, X is fluorine and R_2 is selected from the group consisting of



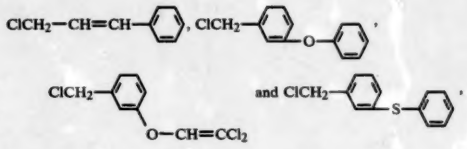
and A is selected from the group consisting of



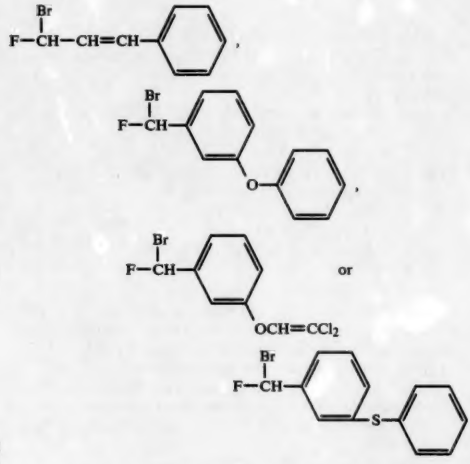
—OCH =CCl_2 and



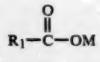
comprising reacting a quaternary ammonium fluoride fixed on a resin with a chloride having a formula selected from the group consisting of



subjecting the corresponding fluoride to the action of N-bromosuccinimide in the presence of azoiosbutyronitrile to obtain a mixed bromide and fluoride derivative of the formula



and reacting the latter with an alkali metal salt of the formula



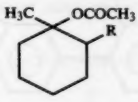
wherein R_1 has the above definition and M is an alkali metal ion.

4,277,618
2-SUBSTITUTED-1-ACETOXY AND HYDROXY-1-METHYL-CYCLOHEXANES

Daniel Helmlinger, Dübendorf, and Peter Naegeli, Wettingen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Dec. 4, 1978, Ser. No. 966,427
Claims priority, application Luxembourg, Dec. 12, 1977, 78670; Switzerland, Oct. 30, 1978, 11175/78
Int. Cl.³ C07C *69/14*
U.S. Cl. 560—231 4 Claims

1. Compounds having the formula:



(I)

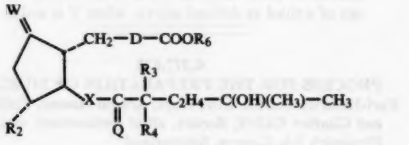
wherein R represents sec. butyl, tert. butyl or cyclohexyl.

4,277,619
19-HYDROXY-19-METHYL-INTER-PHENYLENE-13,14-DIHYDRO-PG$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,878, Apr. 2, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 133,199
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—465 2 Claims

1. A compound of the formula

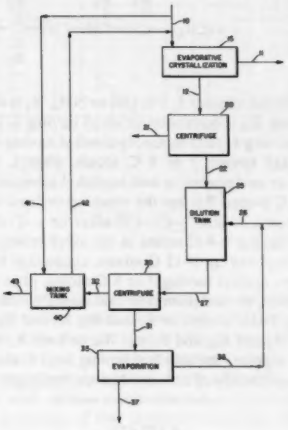


wherein D is
(1) —(m—Ph)—$(CH_2)_2$—, or
(2) —(m—Ph)—O—CH_2—,
wherein —(m—Ph)— is inter-meta-phenylene, and
wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl or 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein W is oxo, methylene, α—OH:β—H, or α—H:β—OH; and
wherein X is —CH_2CH_2—.

4,277,620
BYPRODUCT RECOVERY FROM A PENTAERYTHRITOL WASTE STREAM

B. Frank Gupton, Virginia Beach, and Harry E. Ulmer, Chesapeake, both of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed Feb. 29, 1980, Ser. No. 126,174
Int. Cl.³ C07C *31/24;* C07B *53/02;* C10L *1/18*
U.S. Cl. 562—609 11 Claims



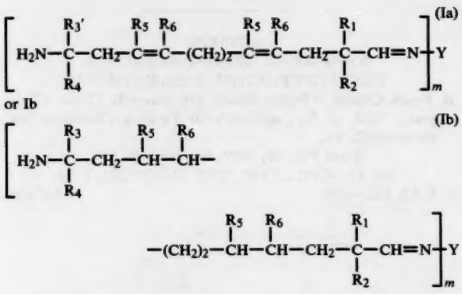
1. A process for recovery of metal formate and pentaerythritol from an aqueous waste stream, which aqueous waste stream is a primary byproduct stream derived from a reaction system in which pentaerythritol is produced by the reaction of formaldehyde with acetaldehyde in the presence of metal hydroxide catalyst and the pentaerythritol product is recovered from the aqueous reaction medium by crystallization, wherein the process comprises the steps of (1) concentrating the primary aqueous waste stream by water removal to precipitate metal formate, and separating the precipitated metal formate from the resultant secondary aqueous waste stream; (2) diluting the said secondary aqueous waste stream with methanol to precipitate a solid mixture comprising metal formate and pentaerythritol, and separating the solid mixture from the resultant tertiary aqueous waste stream; (3) contacting the said solid mixture with a quantity of primary aqueous waste stream to dissolve substantially the metal formate component of the solid mixture thereby forming a sodium formate-enriched aqueous phase and a solid comprising crystalline pentaerythritol; and (4) separating and recycling the said metal formate-enriched aqueous phase to step(1) of the process for blending with the primary aqueous waste stream feed.

4,277,621
SUBSTITUTED 11-AMINO-UNDECA-4,8-DIENAL AND 11-AMINO-UNDECANAL DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Dieter Reinehr, Kandern, Fed. Rep. of Germany, and Josef Pfeifer, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 9, 1979, Ser. No. 83,140
Claims priority, application Switzerland, Oct. 18, 1978, 10769/78
Int. Cl.³ C07C *109/14, 109/16, 131/00*
U.S. Cl. 564—250 9 Claims

1. A compound of formula Ia



(Ia)

or Ib

(Ib)

in which m is the number 1, Y is OH or NH_2, R_1 is alkyl having 1–12 C atoms, R_2 is hydrogen or alkyl having 1–12 C atoms, R_3 is alkyl having 1–12 C atoms, cycloalkyl having 4–12 ring C atoms, aralkyl having 7 or 8 C atoms, phenyl, 1-naphthyl, 2-naphthyl, or said phenyl or said naphthyl substituted by alkyl having 1–4 C atoms, R_3' has the meaning defined for R_3 or, if R_4 is hydrogen, is also —C=CH-alkyl or —C(alkyl)=CH-alkyl, each having 1–4 C atoms in the alkyl moiety, and R_4 is hydrogen alkyl having 1–12 C atoms, cycloalkyl having 4–12 ring C atoms, aralkyl having 7 or 8 C atoms, phenyl, 1-naphthyl, 2-naphthyl, or said phenyl or said naphthyl substituted by alkyl having 1–4 C atoms, or R_1 and R_2, R_3 and R_4 or R_3' and R_4; or both R_1 and R_2; and R_3 and R_4; or both R_1 and R_2; and R_3' and R_4, together are alkylene having 3–11 C atoms, and R_5 and R_6 independently of one another are hydrogen or methyl.

4,277,622

PROCESS FOR PRODUCTION OF 1,17-DIAMINO-9-AZAHEPTADECANE

Touru Asada; Yasuhisa Miura, both of Hazaki, and Tsutomu Yoshino, Yachiyo, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 106,735

Claims priority, application Japan, Jan. 6, 1979, 54-112

Int. Cl.³ C07C *85/00*

U.S. Cl. 564—512 **5 Claims**

1. A process for producing 1,17-diamino-9-azaheptadecane which comprises adding nitric acid to octamethylenediamine, heating the mixture to eliminate ammonia therefrom, stopping the reaction when the conversion reaches 10 to 40%, and neutralizing the reaction product with an alkali.

4,277,623

CONVERSION OF ALKANE AND/OR CYCLOALKANE THIOLS TO DISULFIDE WITH CATALYST SYSTEM COMPRISED OF COBALT MOLYBDATE AND AN ALKALI- OR ALKALINE EARTH METAL HYDROXIDE

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1979, Ser. No. 67,645

Int. Cl.³ C07C *149/10*

U.S. Cl. 568—26 **7 Claims**

1. A process for the conversion of at least one of an alkane and a cycloalkane thiol to a corresponding disulfide in high yield and selectivity which consists essentially of subjecting the same to at least one of oxygen and air in the presence of a catalyst consisting essentially of a small amount of the order of 0.2 to 4 grams per mole of thiol of at least one of an alkali metal hydroxide and alkaline earth metal hydroxide together with a cobalt molybdate catalyst, the cobalt molybdate catalyst being on a suitable support and being substantially insoluble in the reaction medium, and the reaction being effected with the aid of a solvent which is at least one comprised of an alcohol in which the hydroxide is soluble and said alcohol and water.

4,277,624

PROCESS FOR PREPARING DIPHENYL ETHERS

Takeo Yoshimoto, Yokohama; Keiichi Igarashi, Musashino; Kengo Oda; Masaaki Ura, both of Yokohama, and Naoki Sato, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

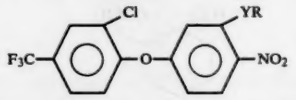
Filed Jul. 5, 1979, Ser. No. 54,865

Claims priority, application Japan, Jul. 5, 1978, 53-80860

Int. Cl.³ C07C *41/00, 148/00*

U.S. Cl. 568—44 **9 Claims**

1. A process for preparing a diphenyl ether compound expressed by the general formula:



wherein R represents a hydrogen atom, or substituted or unsubstituted alkyl group, alkenyl group or alkynyl group, and Y represents an oxygen atom or a sulfur atom, comprising reacting 2-chloro-4-trifluoromethylphenyl-3,4-dinitrophenyl ether:

(a) with an alkali metal hydroxide, or with an alcohol selected from the group consisting of substituted or unsubstituted alkyl alcohols, alkenyl alcohols and alkynyl alcohols in the presence of an alkali metal hydroxide, or with an alkali metal salt of an alcohol as defined above, when Y is oxygen, or

(b) with an alkali metal hydrosulfide, or with a thiol selected from the group consisting of substituted or unsubstituted alkyl thiols, alkenyl thiols and alkynyl thiols in the presence of an alkali metal hydroxide, or with an alkali metal salt of a thiol as defined above, when Y is sulfur.

4,277,625

PROCESS FOR THE PREPARATION OF MUSCONE

Karl-Heinrich Schulte-Elte, Onex; Arnold Hauser, Petit-Lancy, and Günther Ohloff, Bernex, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Nov. 20, 1979, Ser. No. 96,054

Claims priority, application Switzerland, Dec. 7, 1978, 12510/78

Int. Cl.³ C07C *45/60*

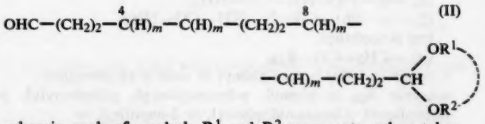
U.S. Cl. 568—341 **4 Claims**

1. Process for the preparation of muscone which comprises

a. subjecting to acetalysation in the presence of an acid catalyst a dialdehyde of formula

(I)

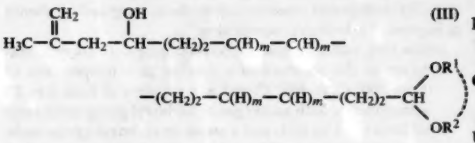
containing two single or two double bonds in positions 4 and 8 of the chain as indicated by the dotted lines and wherein index m stands for 1 or 2, to give a monoacetal of formula



(II)

wherein each of symbols R^1 and R^2 represents, when taken separately, a lower alkyl radical, or when taken together, a lower alkylene radical,

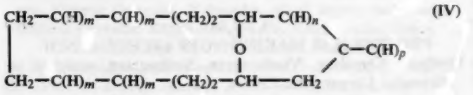
b. adding a methallyl-magnesium halide on the obtained mono-acetal and hydrolyzing the resulting adduct under Grignard reaction conditions to give a hydroxy derivative of formula



(III)

wherein symbols R^1 and R^2, index m and the dotted lines have the above given meaning,

c. cyclising in an inert organic solvent by means of an acidic cyclisation agent compound of formula (III) to yield a bicyclic oxygenated compound of formula



(IV)

wherein index m and the dotted lines have the above indicated meaning and

(a) n=1 and p=3 or

(b) n=2 and p=2, and

d. subjecting said compound (IV) to an isomerisation and a catalytic hydrogenation in the presence of a hydrogenation catalyst and in an inert organic solvent to yield muscone.

4,277,626

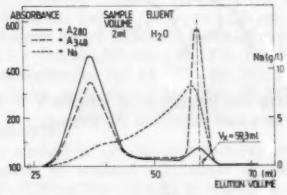
METHOD FOR THE ISOLATION OF VANILLIN FROM LIGNIN IN ALKALINE SOLUTIONS

Kaj G. Forss, Stahlbergintie 6 D, 00570 Helsinki 57; Esko T. Talka, Norotie 6 C, 01600 Vantaa 60, and Kaj-Erik Fremer, Pajalahdentie 6 A, 00200 Helsinki 20, all of Finland

Filed Jan. 24, 1980, Ser. No. 115,048

Int. Cl.³ B01D *15/04*

U.S. Cl. 568—438 **6 Claims**



1. A method for the separation of sodium vanillate from lignin and alkali in alkaline aqueous solutions, comprising the steps of feeding an alkaline aqueous solution containing sodium vanillate and a material selected from the group of lignin and alkali into a bed of a cation exchange resin in its sodium salt form, said sodium vanillate and said material being adsorbed on the resin at different strength levels, and eluting the adsorbed sodium vanillate and said material from the resin by aqueous solution, said sodium vanillate being collected primarily in one elution volume and said material being collected primarily in a second elution volume.

4,277,627

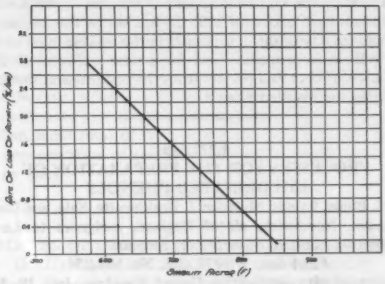
HYDROFORMYLATION PROCESS

David R. Bryant, South Charleston, and Ernst Billig, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 762,336, Jan. 25, 1977. This application May 19, 1980, Ser. No. 151,293

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **17 Claims**



1. In a process for hydroformylating an alpha-olefin having from 2 to 20 carbon atoms to produce aldehydes having one more carbon atom than the alpha-olefin by reacting the alpha-olefin with hydrogen and carbon monoxide in the presence of a rhodium complex catalyst consisting essentially of rhodium complexed with carbon monoxide and a triphenylphosphine, and in the presence of free triphenylphosphine the improvement comprising

operating said process at a temperature of from about 90° to about 130° C., a partial pressure of carbon monoxide of less than about 55 pounds per square inch absolute, a partial pressure of hydrogen of less than about 200 pounds per square inch absolute, a total gas pressure of hydrogen, carbon monoxide and alpha-olefin of less than about 400 pounds per square inch absolute, and at least about 100 moles of free triphenylphosphine per mole of catalytically-active rhodium metal; and

minimizing or substantially preventing deactivation of said rhodium complex catalyst to a maximum determined rate of loss of activity by controlling and correlating the carbon monoxide partial pressure, the temperature and the free triphenylphosphine:catalytically-active rhodium metal mole ratio within said values to provide the minimum stability factor F necessary to give essentially the minimum rate of loss of activity according to FIG. 1 of the drawings;

said stability factor F being defined by the equation:

$$F = \frac{1000}{1 + e^{Y}}$$

where

F=stability factor,

e=Naperian log base (2.718281828),

$y = K_1 + K_2T + K_3P + K_4(L/Rh)$,

$K_1 = -8.1126$,

$K_2 = 0.07919$,

T=the reaction temperature (°C.),

$K_3 = 0.0278$,

P=the carbon monoxide partial pressure (psia),

$K_4 = -0.01155$, and

(L/Rh)=the free triphenylphosphine:catalytically-active rhodium metal mole ratio.

4,277,628

PHENOL RECOVERY FROM BISPHENOL-A WASTE STREAMS

James C. Carnahan, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 20, 1980, Ser. No. 151,664
Int. Cl.[3] C07C 37/68, 37/74
U.S. Cl. 568—749 4 Claims

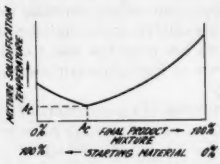
1. The process for producing liberated phenol by cracking a tarry residue derived from the acid reaction of phenol and acetone thereby to make bisphenol-A, which process comprises heating the said residue with aluminum isopropoxide at a temperature in excess of 150° C., but below the decomposition point of any of the compounds in the residue in an amount of aluminum isopropoxide and for a time sufficient to cause distillation of liberated phenol from the residue, and thereafter collecting the distilled phenol.

4,277,629

PROCESSES FOR THE PREPARATION OF CHLORINATED PHENOLS

John S. Binns, Lymm; Malcolm J. Braithwaite, Sale, and George Dignum, Northwich, all of England, assignors to Lankro Chemicals Limited, Manchester, England

Filed Jun. 7, 1977, Ser. No. 804,254
Claims priority, application United Kingdom, Jun. 18, 1976, 25321/76
Int. Cl.[3] C07C 39/28
U.S. Cl. 568—779 10 Claims



1. A process for the preparation of p-chloro-phenols comprising reacting a para-unsubstitued phenol selected from the group consisting of phenol, orthocresol, and metacresol in melt form with sulphuryl chloride in a plurality of discrete reaction stages, each comprising the steps of:

(a) supplying only a part of the sulphuryl chloride needed for total conversion of all of the para-unsubstituted phenol to the discrete reaction stage to form a reaction mixture, and subsequently,

(b) maintaining the reaction mixture at a temperature within 20° C. above the solidification temperature of the reaction mixture present at the end of the stage for such a period of time that the sulphuryl chloride supplied to the discrete reaction stage is at least substantially completely reacted in the stage,

from 40% to 85% of the total sulphuryl chloride being supplied in the first stage, the final reaction stage being effected at a temperature above that of a previous stage, and taking the reaction of said para-unsubstituted phenol substantially to completion.

4,277,630

CATALYST AND PROCESS FOR PRODUCING AROMATIC HYDROXY COMPOUNDS

Abraham P. Gelbein, Plainfield, and Ali M. Khonsari, Bloomfield, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 853,040, Nov. 21, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,481
Int. Cl.[3] C07C 37/00
U.S. Cl. 568—801 6 Claims

1. A process for catalytically oxidizing an aromatic carboxylic acid selected from the group consisting of benzoic acid and alkyl substituted benzoic acid to the corresponding phenol at improved selectivity, comprising:

contacting said aromatic carboxylic acid with oxygen and steam in the presence of a catalyst at a temperature of from 200° C. to 400° C. and at a pressure of from 2 to 20 atmospheres, with an oxygen to carboxyl group mole ratio of from 0.2:1 to 10:1, and a steam to carboxyl group mole ratio of from 5:1 to 500:1, said catalyst being comprised of oxidized copper, zirconium and an alkali metal wherein the copper:zirconium:alkali metal atomic ratio is from 1:0.2 to 0.5:0.5 to 2.5.

4,277,631

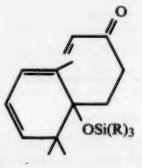
PROCESS FOR MAKING NORPATCHOULENOL

Wolfgang Oppolzer, Vandoeuvres, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Aug. 6, 1979, Ser. No. 64,445
Claims priority, application Switzerland, Aug. 10, 1978, 8520/78
Int. Cl.[3] C07C 35/37, 29/00
U.S. Cl. 568—817 12 Claims

1. A process for the production of substituted 5,5,8a-trimeythyl-1,6-methanonaphthalenes, which comprises:

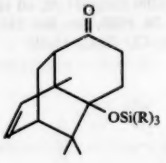
(a) cyclising, via an intramolecular Diels Alder reaction, a compound of the formula



IV

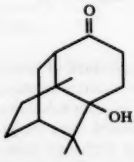
wherein R represents a lower alkyl, phenyl, lower alkylphenyl or phenyl lower alkyl group wherein the lower alkyl groups contain from 1 to 4 carbon atoms,

to give a compound of the formula



V

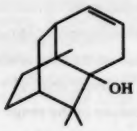
(b) Converting said compound of formula V to the corresponding saturated alcohol of the formula



by removing the trisubstituted silyl group using mild acid hydrolysis and selectively hydrogenating the 7,8 double bond to a single bond using a noble metal catalyst and

(c) converting said compound of formula VII to norpatchoulenol of the formula

VIII



by means of a Bamford-Stevens reaction.

4,277,632

PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOLS

Toshihiko Kumazawa, Yokohama; Takeshi Yamamoto, Tokyo, and Hiroshi Odanaka, Yokosuka, all of Japan, assignors to Nippon Shokubai Kaguku Kogyo Co., Ltd., Osaka, Japan

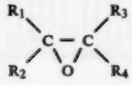
Filed Sep. 19, 1979, Ser. No. 76,842

Claims priority, application Japan, Jul. 9, 1979, 54-85935; Jul. 12, 1979, 54-87510; Jul. 20, 1979, 54-91695; Jul. 24, 1979, 54-93218; Jul. 30, 1979, 54-96155; Aug. 1, 1979, 54-97377; Aug. 6, 1979, 54-99471

Int. Cl.³ C07C *31/20, 33/035, 33/05, 33/30*

U.S. Cl. 568—867 23 Claims

1. A process for the production of substituted or unsubstituted ethylene glycols, which comprises causing a corresponding ethylene oxide of the formula



wherein R_1, R_2, R_3, and R_4 each denote a hydrogen atom, an alkyl group having 1 to 3 carbon atoms, an aryl group having 6 carbon atoms, an alkenyl group having 2 or 3 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms to react with water in the presence of a catalyst of at least one member selected from the group consisting of metallic molybdenum, metallic tungsten, molybdenum compounds and tungstic acid and the salts thereof in an atmosphere of nitrogen or carbon dioxide.

4,277,633

PALLADIUM COMPLEX, PROCESS FOR THE PREPARATION THEREOF AND CATALYST FOR PRODUCING 1,3-DIENE OLIGOMERS

Satoru Enomoto, Fujisawa; Hisayuki Wada, Tokyo; Sadao Nishita, Tokyo; Yutaka Mukaida, Tokyo; Mikiro Yanaka, Matsudo, and Hitoshi Takita, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

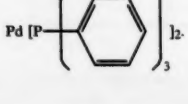
Division of Ser. No. 904,407, May 10, 1978, Pat. No. 4,196,135. This application Jul. 12, 1979, Ser. No. 57,030

Claims priority, application Japan, May 18, 1977, 52-56311

Int. Cl.³ C07C *33/02*

U.S. Cl. 568—879 2 Claims

1. In the method for producing a hydroxy containing 1,3-diene oligomer by reacting a 1,3-diene of the formula $CH_2{=}CR^1{-}CR^2{=}CH_2$, wherein R^1 and R^2 are identical or different and are hydrogen or alkyl, with an aldehyde, the improvement comprising using, as a catalyst, bis[tri(ortho-tolyl)phosphine] palladium having the formula



4,277,634

PROCESS FOR THE SELECTIVE HOMOLOGATION OF METHANOL TO ETHANOL

Wellington E. Walker, Sissonville, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 9, 1980, Ser. No. 138,688

Int. Cl.³ C07C *27/00, 29/36*

U.S. Cl. 568—902 11 Claims

1. In a process for selectively producing ethanol from the reaction of methanol, hydrogen and carbon monoxide at a pressure of from 1,000 psig to 10,000 psig and a H_2:CO mole ratio of from 1:10 to 10:1 and wherein the reaction is catalyzed by a catalyst system consisting essentially of cobalt and iodide ion, the improvement consisting of carrying out the reaction at a temperature of from greater than 180° C. to 220° C. in the presence of a substantially inert solvent from the group consisting of dioxane, toluene, tetrahydrofurane, the dimethyl ether of tetraethylene glycol and 1,2-dimethoxybenzene at an iodide to cobalt mole ratio of 0.1:1 to 4:1 and wherein the volume ratio concentration of said inert solvent to methanol is from 0.5:1 to 100:1.

4,277,635

PROCESS OF CONCENTRATING ETHANOL FROM DILUTE AQUEOUS SOLUTIONS THEREOF

Charles S. Oulman, Ames, and Colin D. Chriswell, Slater, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 24, 1980, Ser. No. 162,524

Int. Cl.³ C07C *31/08, 29/76*

U.S. Cl. 568—916 11 Claims

1. The process of concentrating ethanol from an aqueous solution thereof, comprising:

(a) passing a relatively dilute liquid aqueous ethanol feed through a bed composed of graules of a crystalline silica polymorph capable of selectively adsorbing ethanol from an aqueous solution thereof, said feed having an ethanol concentration of less than 70% by weight.

(b) discontinuing the passing of said feed through said bed when said granules have become loaded with adsorbed ethanol, said bed containing residual dilute aqueous ethanol feed;

(c) passing a displacer liquid through said bed to displace said residual feed without displacing the adsorbed ethanol, said displacer liquid comprising aqueous ethanol containing at least 80% ethanol by weight;

(d) continuing said passing of said displacer liquid through said bed until substantially all of said dilute ethanol feed has been displaced from said bed so that it contains said adsorbed ethanol together with said displacer liquid; and

(e) thereafter removing said adsorbed ethanol from said bed together with at least a portion of displacer liquid and obtaining a concentrate product consisting of an admixture thereof which has an ethanol concentration of at least 80% by weight.

4,277,636

PROCESS FOR PREPARING HIGH DENSITY FUELS

Richard V. Norton, Dublin; Peter J. Frank; Dennis H. Fisher, both of Westerville, and Steven C. Howe, Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 11, 1980, Ser. No. 176,728

Int. Cl.³ C10L *1/04*

U.S. Cl. 585—14 6 Claims

1. In a method for the preparation of a trimerization product of cyclopentadiene and methylcyclopentadiene wherein a neat mixture of the dimers of said dienes is heated to effect the progressive partial dissociation thereof to the respective monomers and the reoligomerization of the resultant reaction mixture to provide the trimerization product; the improvement of effecting said dissociation and reoligomerization in the presence of an inert hydrocarbon solvent.

4,277,637

PROCESS FOR PURIFYING ARYL-SUBSTITUTED MONO-OLEFINS

Debra S. K. Kalmbach, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 9, 1978, Ser. No. 868,012
Int. Cl.[3] C07C 7/12
U.S. Cl. 585—828 10 Claims

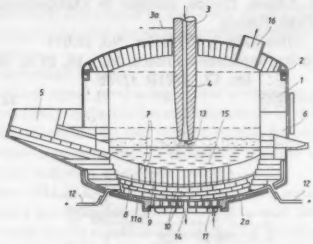
1. A process for removing α-alkylstyrene, impurities of the group consisting of α-alkylstyrene, nuclear alkyl derivatives of α-alkylstyrene, and nuclear alkenyl derivatives of α-alkylstyrene, from starting mixtures thereof with at least one styrenic monomer of the group consisting of styrene and nuclear alkyl derivatives of styrene, which comprises contacting the starting mixture of styrenic monomer containing α-alkylstyrene impurities with a macroporous, sulfonic acid, H^+ form cation exchange resin containing moisture in the range of from about 20 percent to about 30 percent weight of water based on the weight of the dry resin.

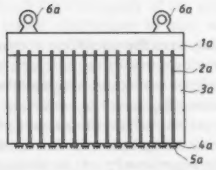
4,277,638

PREFABRICATED UNIT FOR A DC ARC FURNACE

Sven-Einar Stenkvist, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Dec. 28, 1979, Ser. No. 107,764
Claims priority, application Sweden, Dec. 29, 1978, 7813408
Int. Cl.[3] F27D *1/00;* H05B *7/00*
U.S. Cl. 13—35 4 Claims





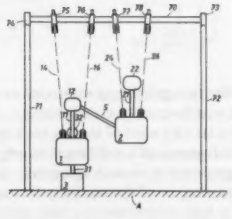
1. A prefabricated unit for a DC arc furnace having a hearth bottom made of electrically conductive bricks, said unit comprising a metal plate, a cluster of metal rods depending from said plate and which are fixed to the plate in electrically conductive connection with the plate, and an electrically non-conductive refractory compound rammed or cast around said rods and the bottom of said plate with the bottom ends of the bars exposed below the compound, said unit being adapted to be installed on said bricks with the bar's said bottom ends in electrical connection with the bricks so as to form an electrically conductive hearth for the furnace.

4,277,639

HIGH-VOLTAGE INSTALLATION INCLUDING HEAVY ELECTRICAL APPARATUS SUSPENDED BY INSULATOR MEANS

Karl E. Olsson, Ludvika, Sweden, assignor to ASEA Aktiebolag, Sweden

Filed Mar. 19, 1980, Ser. No. 131,345
Claims priority, application Sweden, Mar. 27, 1979, 7902707
Int. Cl.[3] H01F *27/06;* H02B *1/18, 5/04*
U.S. Cl. 174—42 8 Claims



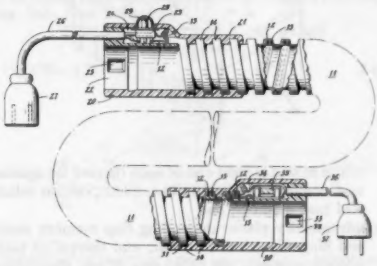
1. A high-voltage installation comprising an electrical high-voltage apparatus with a weight exceeding 10 tons and an operating voltage exceeding 100 kV, and a support structure including a supporting member from which said high-voltage apparatus is suspended by means of a plurality of elongated electrically insulating suspension members, each suspension member being attached to said supporting member through resilient means for allowing relative movement between said apparatus and said supporting member in the longitudinal direction of said suspension members.

4,277,640

ELECTRIC CURRENT-CARRYING HOSE ASSEMBLY HAVING END FITTINGS ENCLOSING AN ELECTRICAL SWITCH AND/OR A CIRCUIT-BREAKING DEVICE

Thomas A. Kutnyak, Greenwood; Marvin A. Koerber, Abbeville, and Henry K. Wills, Greenwood, all of S.C., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Apr. 26, 1979, Ser. No. 33,413
Int. Cl.[3] A47L *9/24, 9/28;* F16L *11/12*
U.S. Cl. 174—47 6 Claims



1. A flexible, electric current-carrying hose assembly comprising:

(1) a flexible hose having a passageway therethrough and first and second current-carrying leads extending between first and second ends;

(2) first and second hose-coupling cuffs attached to said first and second ends, respectively, of said flexible hose, at least one of said cuffs having a sealed chamber formed therein with the seal between said chamber and said passageway being formed by intrusion of said hose into an opening between said chamber and said passageway;

(3) switch means mounted and sealed within said sealed chamber with an actuator extending from said chamber; and

(4) first and second electrical cords each terminated with a plug and connected to said first and second cuffs, respectively, said cords, said switch means and said leads being electrically connected to form a controllable electrical current path between said plugs.

4,277,641

ELECTRICAL OUTLET BOX AND CABLE CLAMP DEVICE

Claude J. Bauer, and Kenneth M. Moore, both of Parkersburg, W. Va., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 26, 1979, Ser. No. 78,998
Int. Cl.[3] H02G *3/08*
U.S. Cl. 174—65 R 17 Claims

1. An electrical wiring box arrangement of a wiring box and cable clamp device, including in combination:

a wiring box comprising:

a wall structure defining front to rear walls and a rear wall therebetween which in combination define a chamber within the box; said wall structure having a knock-out region for providing a knock-out opening for receiving non-metallic sheathed cable, and attachment receiving

means for mounting said cable clamp device interior to said box adjacent to said knock-out region; and

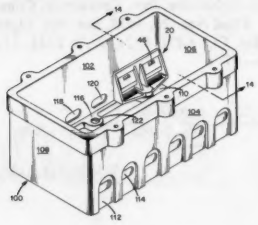
a cable clamp device for non-metallic sheathed cable comprising:

a base member having a first cable engaging means and attachment means receivable in said attachment receiving means of said box wall structure for mounting said cable clamp device in said box;

a first and a second support member, each having a first end thereof attached to said base member;

a connecting member disposed between said first and said second support members, said connecting member attached to a second end of each of said support members;

said first and second support members tapering from a first width at said first end of each thereof to a narrower



width at said second end of each thereof for maintaining said connecting member in a fixed position relative to said base member; and

a substantially planar depending flap member resiliently and hingedly attached at one end thereof to said connecting member, the other end of said depending flap member providing a second cable engaging means, said second cable engaging means being spaced apart from and opposing said first cable engaging means;

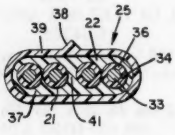
whereby a non-metallic sheathed cable passed through a knock-out opening of said wiring box having said cable clamp device attached thereto passes between said base member and said depending flap member of said clamp device and is gripped between said first cable engaging means and said second cable engaging means.

4,277,642

CORDAGE HAVING A PLURALITY OF CONDUCTORS IN A PARTITIONED JACKET

George F. Piper, Baltimore; William C. Vesperman, Bel Air, and Max K. Wilson, Cockeysville, all of Md., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 943,425, Sep. 15, 1978, Pat. No. 4,221,756.
This application Jan. 9, 1980, Ser. No. 110,577
Int. Cl.[3] H01B *7/08*
U.S. Cl. 174—117 F **4 Claims**



1. Telephone cordage, which includes:

at least two groups of relatively flexible, individually insulated conductors which are disposed in a planar array;

a plastic jacket which encloses said groups of conductors;

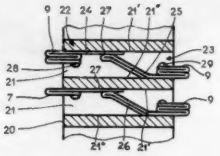
a web of plastic material which is integral with the jacket and which separates adjacent groups of conductors, said web having a thickness which varies along the cordage to compensate for conductor size variations and to cause the distance from an outwardly facing surface of each outermost conductor in the array to be spaced a substantially constant distance from the outwardly facing surface of the jacket along the length of the cordage.

4,277,643

CONNECTING MEMBER FOR TELEPHONE SYSTEMS

Yves Saligny, Cluses, France, assignor to Etablissements Carpano and Pons, France

Filed May 1, 1979, Ser. No. 35,079
Claims priority, application France, May 18, 1978, 78 15657
Int. Cl.[3] H01R *31/08*
U.S. Cl. 179—1 PC **12 Claims**



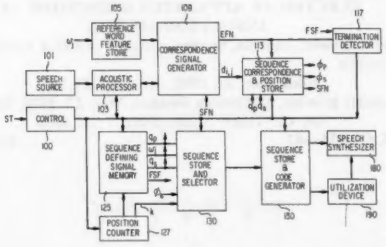
9. A distributing strip for telephone systems comprising an insulating case having a row of cavities each having two opposite walls, and at least one connecting member in each of said cavities, said connecting member consisting of a flat unitary conducting element of uniform thickness, a portion of said flat conducting element being bent over flat on itself at least once with the resulting superposed portions pressed flat against one another to form a thickner, rigid multi-ply terminal portion from one side of which at least one thinner portion of said connecting member extends, and means for securing said rigid terminal portion of said connecting member to a wall of the respective cavity of said insulating case.

4,277,644

SYNTACTIC CONTINUOUS SPEECH RECOGNIZER

Stephen E. Levinson, Westfield, and Frank C. Pirz, Madison, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 16, 1979, Ser. No. 57,749
Int. Cl.[3] G10L *1/00*
U.S. Cl. 179—1 SD **15 Claims**



1. Apparatus for recognizing an utterance as one of a plurality of reference word sequences comprising:

means (**205**) for storing a set of signals each representative of the acoustic features of a reference word;

means (**203**) responsive to said utterance for generating a signal representative of the acoustic features of the utterance;

means (**411**) for generating a set of first signals defining the plurality of sequences, each sequence being a series of reference words;

means (**427**) for generating a succession of second signals identifying the successive word positions of the plurality of sequences;

means (**209, 425, 427**) responsive to the set of first signals, the utterance feature signals and the reference word feature signals for producing a set of third signals each representative of the correspondence between said utterance and one of said sequences; and

means (**430**) responsive to said third signals for selecting the sequence having the closest correspondence to said utterance;

characterized in that

said third signal producing means comprises:

means (**361**) operative for each sequence in each word position identified by said second signals for storing a fourth signal representative of the word position utterance segment endpoint of said sequence;

means (**351,383,411**) operative for each sequence in each word position jointly responsive to said first signals and stored fourth signal of the preceding word position of the sequence for selecting the utterance feature signals beginning at the preceding word position utterance segment endpoint of the sequence and the current word position reference word feature signals of the sequence; and

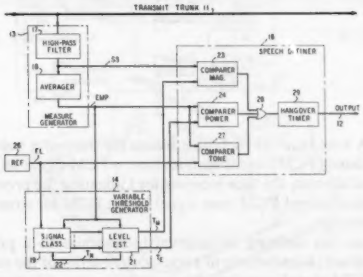
means (**209**) jointly responsive to said sequence selected utterance feature signals and the sequence selected reference word feature signals for concurrently generating a fourth signal representative of the endpoint of the current word position utterance segment corresponding to the selected reference word, and a signal representative of the correspondence between the selected utterance segment feature signals from the preceding word position utterance segment endpoint for the sequence and the current word position selected reference word feature signals for the sequence.

4,277,645

MULTIPLE VARIABLE THRESHOLD SPEECH DETECTOR

Carl J. May, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 25, 1980, Ser. No. 115,185
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SC **9 Claims**



1. Apparatus for indicating the occurrence of speech in a signal indicative of both speech and noise, the apparatus including:

means for generating (**13**) a representation of the average magnitude of the signal during a moving time interval;

the apparatus being characterized by classifying means (**19**) for receiving said representation and a noise level estimate, said classifying means generating a first output to indicate when said representation has prescribed attributes indicative of speech and a second output to indicate when said representation has prescribed attributes indicative of noise;

level estimator means (**21**) responsive to said first and second outputs and said representation, said level estimator means providing a noise level estimate using the portion of said representation identified by the occurrence of said second output, said level estimator means providing a first decision level output by combining said noise level estimate and the portion of said representation defined by the occurrence of said first output in excess of a prescribed amount of said first decision level output; and

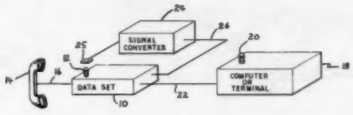
comparing means (**16**) for providing an output indicative of the occurrence of speech signal activity when said first decision level is exceeded by the signal.

4,277,646

APPARATUS AND METHOD FOR RESETTING DATA SETS

Terry L. Sams, Roswell, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 24, 1979, Ser. No. 69,467
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 DP **2 Claims**



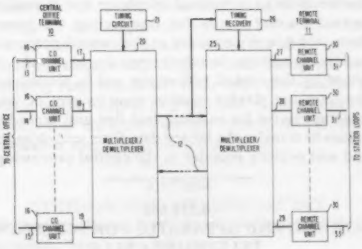
1. A method of resetting a data set coupling a telephone with a computer or with a data terminal of the type having light signaling means for signaling the completion of a communication and reset terminal means for receiving a data set reset signal upon completion of the communication, and with the reset method comprising the steps of generating an oscillatory electrical signal; monitoring the data set light signaling means; and applying the oscillatory electrical signal to the data set reset terminal means when the light signaling means signals the completion of a communication.

4,277,647

COIN SIGNALING SYSTEM

Stephen J. Brolin, Livingston, and Samuel Colodner, Succasunna, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1979, Ser. No. 71,713
Int. Cl.³ H04M *17/02*
U.S. Cl. 179—6.3 R **10 Claims**



1. A coin supervisory signal detector for central office wire pairs in a telephone system

characterized by

voltage detection means for detecting the magnitude and polarity of voltages appearing on said wire pairs,

a plurality of optical isolators for detecting the direction of current flow in each wire of said wire pairs, and

combinatorial logic circuit means for combining the outputs of said voltage detection means and the outputs of said isolators to provide separate indications of each of a plurality of unique coin supervisory signaling states to be transmitted to a remote location in said telephone system.

4,277,648

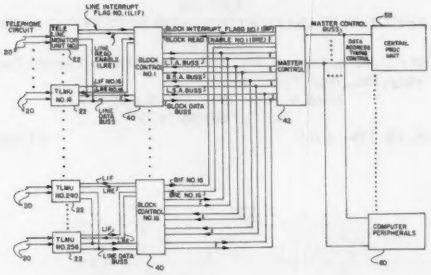
TELEPHONE MONITORING APPARATUS

David M. Glassman, 13 Gateway Cir., Rochester, N.Y. 14624

Continuation-in-part of Ser. No. 971,231, Dec. 20, 1978. This application Apr. 28, 1980, Ser. No. 144,200

Int. Cl.³ H04M *15/38*

U.S. Cl. 179—7.1 R **4 Claims**



1. In monitoring apparatus for monitoring a plurality of telephone lines, the apparatus including a central processing unit operative under an appropriate program including an interrupt service routine to process data presented thereto, the improvement comprising:

(a) a plurality of telephone monitor units each including (i) a detector means connected to a telephone line for sensing the status of said line and for producing signal pulses whenever changes in the status occur, (ii) storage means responsive to said signal pulses for temporarily storing binary data representative of the change of status information and for providing a first interrupt signal indicating that a change in status has occurred, and (iii) first transfer means for transferring the binary data from said storage means to the central processing unit; and

(b) at least one control unit, said control unit including (i) a priority encoder connected to said telephone monitor units, said priority encoder being activated upon receipt of said first interrupt signal to produce a binary value representative of that telephone monitor unit interrupting and to provide on an electrical connection to the central processing unit a CPU interrupt signal indicating that information from an individual telephone line is available, (ii) second transfer means for transferring the binary data from said priority encoder to the central processing unit and (iii) an address decoder responsive to a read command issued by the central processing unit in accordance with the interrupt service routine upon receipt of said CPU interrupt signal for enabling said first and second transfer means to transfer the binary data from said storage means and said priority encoder to the central processing unit.

4,277,649

METHOD AND APPARATUS FOR SCREENING TELEPHONE CALLS

Daniel Sheinbein, Elizabeth, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

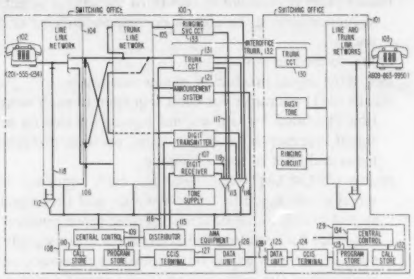
Filed Jan. 18, 1980, Ser. No. 113,384

Int. Cl.³ H04M *3/42*

U.S. Cl. 179—18 B **15 Claims**

1. A method of controlling the special service treatment of telephone calls destined for called stations from preselected calling stations comprising the steps of

entering into a memory associated with a particular called station the identity of a preselected calling station and an indication designated by the particular called station of the special service treatment to be given to calls subsequently received from said preselected calling station,



identifying each station originating a subsequent call to said particular called station,

reading the memory according to the identity of the station originating the call to ascertain the special service treatment indication for each call to the particular called station, and

disposing of the call according to said special service indication.

4,277,650

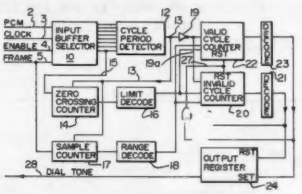
SINGLE FREQUENCY TONE RECEIVER

Inez F. Arend, Mountain View, and James S. Locke, Palo Alto, both of Calif., assignors to Northern Telecom Limited, Ottawa, Canada

Filed Jul. 2, 1979, Ser. No. 53,826

Int. Cl.³ H04M *1/50*

U.S. Cl. 179—84 VF **8 Claims**



1. A tone receiver including means for receiving pulse code modulated (PCM) signal samples from a PCM signal bit stream applied thereto, the tone receiver for indicating the presence of a predetermined PCM tone signal in the PCM bit stream, and comprising:

means for defining an interval in response to a predetermined characteristic in a consecutive series of the received PCM signal samples, the interval having a beginning in response to the predetermined characteristic including an occurrence of at least two consecutively received PCM signal samples of one polarity and at least meeting a predetermined magnitude threshold, and the interval having an ending in response to the predetermined characteristic including an occurrence of at least two consecutively received PCM signal samples of the other polarity and at least meeting a predetermined magnitude threshold; and

means for detecting the tone signal in response to a total number of the PCM signal samples received during the interval being within a predetermined range and in re-

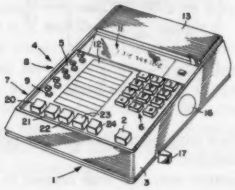
sponse to a total number of polarity changes in the PCM signal samples received during the defined interval being less than a predetermined limit.

4,277,651

TELEPHONE DIALER

Theodore H. Fisher, II, Sparks, Nev., and Richard J. Cusimano, Jamestown, N.Y., assignors to Basic Incorporated, Cleveland, Ohio

Filed Sep. 13, 1978, Ser. No. 942,051
Int. Cl.³ H04M *1/274*
U.S. Cl. 179—90 B **23 Claims**



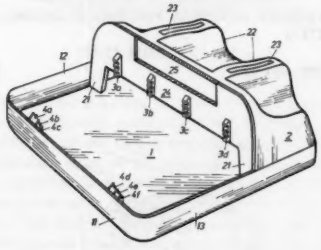
1. A microprocessor based automatic dialing system for telephone equipment, comprising first memory means for storing information at plural addressable locations representing plural respective telephone numbers, a central processor unit, second memory means for storing program control information for controlling said central processor unit to read out selected information from said first memory means, said central processor unit including command output means for periodically producing command signals commanding the input of information to said central processor unit, and decoding means coupled to said command output means for producing a dialing pulse in response to signals over said command output means.

4,277,652

FASTENING ARRANGEMENT IN A TELEPHONE INSTRUMENT

Leif Branden; Jan F. Bruun; Olle Holm, all of Tyresö; Ronnie E. Mellgren, Enskede; Karl A. Ryr, Tyresö; Carl-Axel Strömer, Bromma, and Erling Tronslien, Tyresö, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE78/00061, §371 Date Jun. 24, 1979, §102(e) Date May 31, 1979, PCT Pub. No. WO79/00227, PCT Pub. Date May 3, 1979
This PCT application filed Oct. 18, 1979, Ser. No. 50,171
Claims priority, application Sweden, Oct. 24, 1977, 7711945
Int. Cl.³ H04M *1/02*
U.S. Cl. 179—100 D **9 Claims**



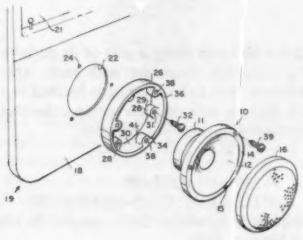
1. A fastening arrangement for a number of circuit cards in a telephone instrument comprising a housing including a base plate provided with perimetral walls extending around the instrument substantially perpendicular to the base plate, a front casing, and a rear casing which has a planar side surface extending perpendicularly to the base plate, said planar side surface facing the front of the instrument and extending substantially along the entire width of said rear casing, supporting elements on said planar side surface for circuit cards, said supporting elements including projections extending parallel to said base plate, each of said projections being provided with a plurality of grooves extending at an angle towards the base plate, each groove having a width corresponding to the thickness of a circuit card, and combined abutment and supporting elements located on the wall of said base plate which is situated at the front of the instrument for supporting and holding circuit cards engaged in the grooves of said projections.

4,277,653

SPEAKER ADAPTER

George K. Pawelzick, 16362 Aztec Ridge Rd., Los Gatos, Calif. 95030

Filed Apr. 30, 1979, Ser. No. 34,248
Int. Cl.³ H04R *1/28*; H04M *1/04*
U.S. Cl. 179—146 E **4 Claims**



1. An adapter for mounting a speaker on a planar panel having an opening to receive the speaker and wherein the speaker comprises a coil assembly, a cone diaphragm and a mounting ring fixed to the outer periphery of the diaphragm and having an inside configuration equal to the cone outer configuration and an outer diameter, said mounting ring having a plurality of holes therethrough extending along the axis of rotation of said cone diaphragm and through which a screw will pass, said adapter comprising in combination:

a rigid adapter ring having an inside wall with a diameter slightly larger than the inside configuration of the mounting ring and an outer wall with a diameter approximately equal to the outer diameter of the mounting ring;

a plurality of first projections extending radially inward from the inside wall of the adapter ring and being positioned to align with the holes through the mounting ring, said projections each having a hole therethrough aligning with the holes in the mounting ring and sized for a screw to be threaded therein;

a plurality of second projections extending radially inward from the inside wall of the adapter ring and spaced between the first projections, each second projection having a hole therethrough extending parallel to the holes through the first projections whereby bolts can be inserted through the holes for attachment to the planar panel; and

the first projections including surfaces facing the speaker mounting ring which are flush with the speaker facing surface of the adapter ring and including opposite facing surfaces that are inset from the corresponding surface of the adapter ring facing the planar panel.

4,277,654

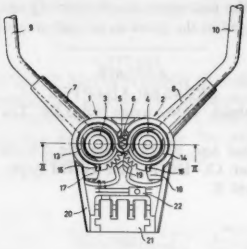
STETHOSCOPIC HEADPHONE SET

Cornelis Penning, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1979, Ser. No. 30,059
Claims priority, application Netherlands, Apr. 17, 1978, 7804041
Int. Cl.³ H04M *1/05*
U.S. Cl. 179—156 R **10 Claims**

1. A stethoscopic headphone set comprising, a pair of arms

which terminate in a hinged connecting apparatus including a wire spring arrangement comprising two helical springs which are mirror-symmetrical and with each arm provided with an earphone, the connecting apparatus comprising two identical disc-shaped coupling members arranged in mirror image and



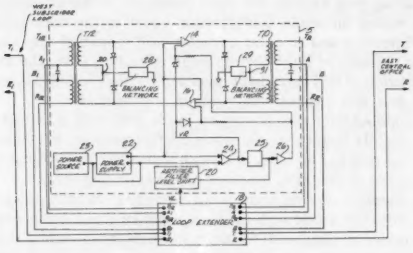
each provided with teeth along a part of its periphery so that said coupling members cooperate with each other via said teeth, and wherein each helical spring is located in a coupling member such that the axis of each spring coincides with the axis of a corresponding coupling member.

4,277,655

AUTOMATIC GAIN REPEATER

Ronald J. Surprenant, Anaheim, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 16, 1978, Ser. No. 951,335
Int. Cl.³ H04B *3/36*
U.S. Cl. 179—170 R **13 Claims**



1. An automatic gain repeater system for use in a telephone transmission line subscriber loop having a subscriber to central office line and a central office to subscriber line, the automatic gain repeater system comprising:

means for connecting said automatic gain repeater system to a telephone central office;

means for connecting said automatic gain repeater system to a telephone subscriber loop;

a first variable controllable West-East amplifier means for amplifying telephone transmission in the subscriber to central office line;

a second variable controllable East-West amplifier means for amplifying telephone transmission in the central office to subscriber line;

means coupled to the central office line and to the subscriber line for delivering constant predetermined amount of power to the subscriber loop and producing thereby a signal in accordance with the subscriber loop impedance; and

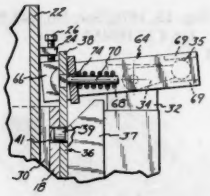
means for controlling the first and second amplifier means in accordance with the signal produced by the means for delivering constant predetermined amount of power to the subscriber loops such that the transmission loss in the subscriber loop is maintained at a predetermined level.

4,277,656

LIMIT SWITCH TRIPPING MECHANISM FOR LIFTING JACKS

Sylvan H. Sime, Walters, Minn., assignor to Simes Inc., Walters, Minn.

Filed Sep. 14, 1979, Ser. No. 75,652
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—47 **24 Claims**



1. A limit switch tripping mechanism comprising:

a stationary member;

a movable member movable with respect to the stationary member;

stop means on the movable member;

limit switch means mounted in a fixed position to the stationary member and having an actuating arm with a normal position and a first position on one side of the normal position;

guide means having a stop engaging member for engaging stop means and an arm guiding portion for guiding the actuating arm;

spring bias means for biasing the guide means to hold the actuating arm in the normal position; and

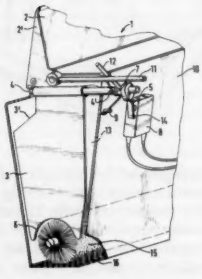
pivotal connecting means for pivotally attaching the guide means to the stationary member allowing the guide means to pivot at a point between the stop means and the guiding portion when engaging the stop means and cause the guiding portion to guide the actuating arm to the first position overcoming the bias means thereby changing the state of the limit switch means.

4,277,657

APPARATUS FOR DETERMINING THE QUANTITY OF PARTICLES PRESENT IN A CONTAINER

Willi Kleinschmidt, Frankfurt, and Hartmut Bock, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,619
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827171
Int. Cl.³ H01H *35/00*
U.S. Cl. 200—61.21 **13 Claims**



1. Apparatus for determining the quantity of particles pres-

ent in a container, the container having a front wall, comprising:

sensor flap means comprising an axle mounted for rotation relative to the container, said axle extending within the container, a flap fixed for rotation with said axle within the container, and a cam fixed for rotation with said axle and said flap;

spring means operatively connected to said axle between said cam and an outer surface of the front container wall for biasing said sensor flap means toward an actuating position indicative of a low level of said particles in the container; and

electrical switch means mounted on the outer surface of the front container wall and actuated by said cam when the flap means is in said actuating position,

whereby said sensor flap means may be placed in a loaded position and said container filled with said particles, said sensor flap means being held in said loaded position by said particles and moving to said actuating position and causing said cam to actuate said electrical switch means when the quantity of said particles in the container falls below a predetermined value.

4,277,658

STEERING COLUMN SWITCH ASSEMBLY

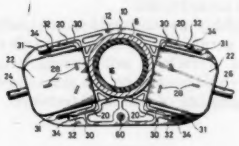
Hermann Delp, Nauheim, and Norbert Muller, Bischofsheim, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1979, Ser. No. 14,320

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1978, 2810790

Int. Cl.³ H01H *9/02*

U.S. Cl. 200—61.54 **4 Claims**



1. In a motor vehicle having a steering column comprising a casing tube surrounding a steering shaft carrying a steering wheel, a steering column switch assembly mounted at the end of the casing tube adjacent the steering wheel, comprising: a plurality of switches having different switching functions, each switch having a housing, electrical connections and an actuating member independent of the other switches, a carrier housing secured to the said end of the casing tube for supporting the switches and having for each switch outside the casing tube and extending parallel to the axis of the steering column a pair of parallel carrier faces disposed approximately tangentially to the casing tube for slidably receiving a switch therebetween, and means for releasably securing the switches to the carrier housing comprising stop portions on at least one face of each pair of carrier faces and the respective switch housings carrying resilient arms for latchingly engaging corresponding stop portions.

4,277,659

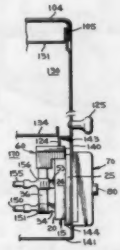
POWER INTERLOCK SWITCH FOR ELECTRICAL APPLIANCES

Harold A. DeRemer, Allentown, Pa., assignor to General Electric Company, New York, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,452

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—61.62 **15 Claims**



1. A power interlock switch for an appliance having a removable panel, a nonconductive base mounted to and disposed inside the appliance, electrical components and a line cord for supplying electrical power to the appliance, the power interlock switch comprising:

(A) a first switch terminal mounted to the nonconductive base;

(B) a second switch terminal mounted to the nonconductive base and spaced apart from the first switch terminal;

(C) a leaf spring conductor mounted to the first switch terminal and extending therefrom to adjacent the second switch terminal, the leaf spring conductor being deflectable into contact with the second switch terminal to establish a conductive path between the first and second switch terminals;

(D) a lever pivotally mounted to the nonconductive base and rotatable to engage the leaf spring conductor and deflect it into contact with the second switch terminal, the lever positioned to be engaged and rotated by the removable panel when the removable panel is in position on the appliance;

wherein one conductor of the line cord is connected to the electrical components of the appliance and the other conductor of the line cord is connected to one of the switch terminals and the other switch terminal is connected to the electrical components of the appliance, whereby contact of the leaf spring conductor with the second switch terminal completes an electrical circuit through the electrical components of the appliance, and wherein removal of the removable panel disengages the removable panel from the lever and permits the leaf spring conductor to move out of contact with the second switch terminal, thereby breaking the electrical circuit through the electrical components of the appliance.

4,277,660

ADJUSTABLE FOOTREST

Alfred Lemmer, Machtlingerstrasse 24, D-8000 Munchen 70, Fed. Rep. of Germany

Filed Aug. 30, 1979, Ser. No. 71,264

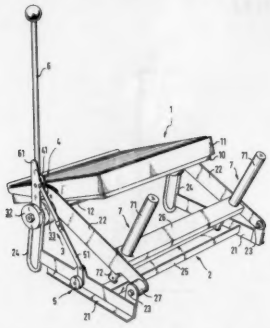
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838654

Int. Cl.³ H01H *19/16, 21/26*

U.S. Cl. 200—86.5 **26 Claims**

1. An adjustable footrest comprising a footrest member, a supporting frame and a height adjustment arrangement interconnecting said footrest member and said supporting frame, said height adjustment arrangement comprising a support lever connected at one end with the footrest and pivoted at its other end to the supporting frame, a link attached to the supporting

frame, a rod connected with the footrest and guided for movement along the link, said footrest member being carried on said rod to pivot with respect to the frame, a height adjustment clamping arrangement on the rod for locking the rod to the link, a pivot adjustment clamping arrangement for clamping said footrest member to said frame and a locking lever con-



nected with both the clamping arrangements such that movement of the locking lever in one direction releases both said clamping arrangements to allow height and pivotal adjustment of said footrest member and movement of said locking lever in the opposite direction locks said footrest member against both height and pivotal movement.

4,277,661

BASIC ELECTRIC SWITCH WITH AN ADDITIONAL SWITCH PORTION

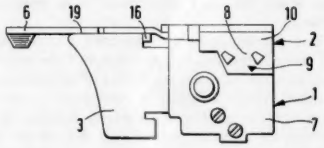
Axel Riess, Tuttlingen, Fed. Rep. of Germany, assignor to J. & J. Marquardt, Fed. Rep. of Germany

Filed Sep. 6, 1979, Ser. No. 73,114

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 7826545[U]

Int. Cl.[3] H01H *13/08;* **H02P** *7/00*

U.S. Cl. 200—157 **4 Claims**



1. A switch construction comprising a first housing part, a first switch contact means mounted in said first housing part, first actuating means associated with said first switch contact means for actuating said first switch contact means, a second housing part, second switch contact means mounted in said second housing part, second actuator means associated with said second switch contact means for actuating said second switch contact means, snap connection means interconnecting said first and second housing parts, wherein said first actuator means comprises a pushbutton, said second actuator means comprises a pivotal lever mounted for pivotal movement on said second housing part adjacent said pushbutton and locking means associated with said lever and said pushbutton for locking said lever in respect to said pushbutton comprising detent locking means defined between said lever and said pushbutton comprising a projection on one of said lever and said pushbutton engageable into a recess portion of the other of said lever and pushbutton, a return spring connected to said lever for holding said lever in an end position and a plurality of connecting terminals engaged on respective portions of said first and second housing parts, said second housing part having spaced apart leg portions containing at least one of said connecting terminals.

4,277,662

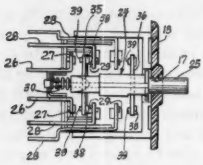
SWITCH BLADE WITH WIPING CONTACT ACTION

Raymond Lewandowski, Waukegan, Ill., assignor to Cherry Electrical Products Corp., Waukegan, Ill.

Filed Jun. 3, 1980, Ser. No. 155,946

Int. Cl.[3] H01H *1/60, 1/20*

U.S. Cl. 200—242 **10 Claims**



1. An electrical switch having a housing for the switch components that include a plurality of fixed terminals wherein the improvement comprises

(a) an actuator reciprocally movable through the switch housing,

(b) an elongated switch blade carried by said actuator between at least two fixed terminals within the switch housing,

(c) said switch blade being a length greater than the width of said actuator so as to extend beyond the opposite sides thereof, said switch blade having a contact on both sides of said switch blade, said contact on one side of said switch blade engaging a first one of said fixed terminals after said contact on the other side of said switch blade is disengaged from a second one of said fixed terminals, and said contact on the other side of said switch blade engaging the second of said fixed terminals after said contact on the one side of said switch blade is disengaged from the first of said fixed terminals as said actuator reciprocally moves within the switch housing,

(b) means provided by said actuator for carrying said switch blade in an angular transverse relation to the longitudinal axis of said actuator, and

(e) means yieldably mounting said switch blade to said actuator so as to permit said switch blade to tilt about its longitudinal axis whereby a self-cleaning, wiping action is provided by said contact on one side of said switch blade upon engaging one of said fixed terminals.

4,277,663

ELECTRICAL SWITCH

Lucas Soes, Rosmalen, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 3, 1980, Ser. No. 126,799

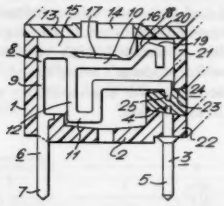
Claims priority, application United Kingdom, Mar. 10, 1979, 08507/79; Sep. 26, 1979, 33244/79

Int. Cl.[3] H01H *15/24, 3/42*

U.S. Cl. 200—283 **10 Claims**

1. An electrical switch comprising a housing carrying a first, fixed contact and a second, movable contact in the form of a resilient contact arm secured to the housing at one end, and an actuator member mounted on the housing and operable to urge the resilient contact arm from a first position out of engagement with the fixed contact into a second position in engagement with the fixed contact, the actuator member being retained in the housing by a part of the second contact, in which the resilient contact arm extends from its end secured to the housing as a single inner limb and then divides into two outer limbs one of which is engaged by the actuator member and the other of which engages the fixed contact on operation of the

actuator member, the arrangement being such that on operation of the actuator member, initially the whole resilient contact arm deflects by bending of the single inner limb until



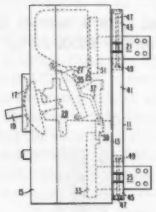
said other outer limb engages the fixed contact whereafter the two outer limbs of the resilient contact arm are deflected towards each other thereby to increase the contact force between said other outer limb and the fixed contact.

4,277,664

CIRCUIT BREAKER STRUCTURE

Alfred E. Maier, and Louis N. Ricci, both of Chipperva Township, Beaver County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 24, 1979, Ser. No. 69,667
Int. Cl.³ H01H 9/02
U.S. Cl. 200—293 **2 Claims**



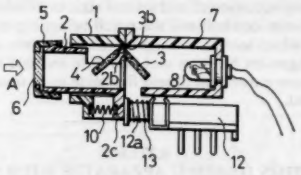
1. A circuit breaker structure comprising a multi-pole circuit breaker having separable contacts for each pole, an insulating housing for said circuit breaker and comprising front and rear end walls, each pole for said circuit breaker comprising at least two vertically spaced incoming and outgoing terminals extending from the rear end wall, the incoming terminals for all poles being horizontally spaced and aligned on one horizontal axis, the outgoing terminals for all poles being horizontally spaced and aligned on another horizontal axis and vertically spaced from that of the incoming terminals, terminal reinforcement means for supporting the terminals against movement in response to magnetic forces when a short circuit occurs, said means extending between and around the terminals on the outer side of the rear end wall, and the means comprising a separable brace and cap assembly which brace extends along one side of at least one of first aligned terminals, the cap extending along the other side of the first aligned terminals, and attachment means for securing the brace and cap into clamping engagement with the aligned terminals.

4,277,665

ILLUMINATED PUSH-BUTTON ELECTRICAL SWITCH

Shiro Kondo, and Michitada Akazawa, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1980, Ser. No. 109,842
Claims priority, application Japan, Jan. 10, 1979, 54/2475[U]
Int. Cl.³ H01H 9/00
U.S. Cl. 200—314 **1 Claim**



1. An illuminated assembly for indicating the operation status of a push button switch, comprising:

a casing having an operation member mounted slidably therein, said operation member having an arm portion adapted to engage an operation rod of a push-button switch for movement therewith;

an indicating plate mounted to an exterior end portion of said operation member, said indicating plate having two sets of graphic symbols each adapted to transmit light and corresponding to a respective status of said switch, said sets of graphic symbols each being formed of different but complementary colors;

a light source held to said casing for illuminating said indicating plate;

two filter members carried by said casing and being formed respectively of said complementary colors; and

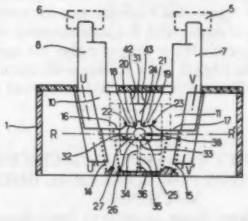
means for positioning said filter members selectively within the light path to said indicating plate during operation of said switch, said filter members being mounted generally orthogonally to one another, said positioning means including tongue elements extending upwardly from said operation member and between said filter members.

4,277,666

SWITCH PUSH BUTTON LOCK

Jean C. Vignaud, Angouleme, France, assignor to La Telemecanique Electrique, France

Filed Apr. 11, 1980, Ser. No. 139,481
Claims priority, application France, Apr. 13, 1979, 79 09416
Int. Cl.³ H01H 9/20
U.S. Cl. 200—328 **4 Claims**



1. A locking device for preventing the simultaneous displacement of two members said locking device comprising: a housing; first and second slides movable in a common plane of said housing between a first and a second position; first and second return springs located in said housing; first and second push buttons respectively associated to said first and second slides and adapted to bring said slides from said first position to said second position when actuated; the first and second slides being respectively associated with the first and second return

springs, each of said slides being provided with a ramp and with an adjoining notch; a bolt resiliently connected to said housing and having a central rest position, located between said ramp and notches at equal distance thereof when both of said slides are in their first position, said bolt further having two symetrical working positions, said ramps and said notches being so directed towards said bolt that, when a first slide is displaced from its first to its second position, said bolt is pushed by a corresponding ramp to a working position wherein a subsequent actuation of said second slide establishes a cooperation between said bolt and the notch belonging to said second slide, in which said bolt is maintained in position and in which any engagement between said first slide and said bolt preventing a return movement of said first slide to its second position, is avoided.

4,277,667

INDUCTION HEATING APPARATUS WITH NEGATIVE FEEDBACK CONTROLLED PULSE GENERATION

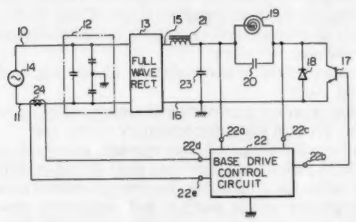
Mitsuyuki Kiuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 21, 1979, Ser. No. 50,757

Claims priority, application Japan, Jun. 23, 1978, 53-76869; Jul. 10, 1978, 53-84472; Aug. 2, 1978, 53-94846

Int. Cl.³ H05B *6/06, 6/12;* **H02M** *7/48*

U.S. Cl. 219—10.49 R **11 Claims**



1. An induction heating apparatus comprising a full-wave rectifier for converting low frequency alternating current energy into full-wave rectified energy, a solid-state inverter including a switching transistor receiving energy from said full-wave rectifier, a diode connected inversely parallel with said transistor, a resonant circuit including an induction heating work coil and a capacitor tuned to a high frequency, a zero crossing detector for detecting a zero crossing point of a potential across said transistor, and a negative feedback-controlled pulse generator including means for generating a signal related to the input power supplied to said full-wave rectifier, a ramp generator responsive to the detected zero crossing point for generating a ramp signal, and a comparator for comparing said input power related signal with the instantaneous value of said ramp signal for generating a trigger pulse for application to said transistor, said trigger pulse having a duration which is a function of the difference between said compared signals.

4,277,668

HIGH-FREQUENCY POWER FEEDER CIRCUITRY AND SUPPLY METHOD FOR ELECTRICAL DISCHARGE MACHINING

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 1, 1979, Ser. No. 16,423

Claims priority, application Japan, Mar. 7, 1978, 53-26332

Int. Cl.³ B23P *1/02*

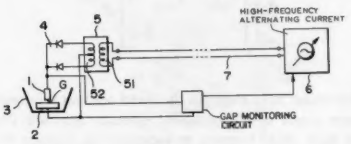
U.S. Cl. 219—69 M **17 Claims**

1. A method of supplying high-frequency electrical discharge machining pulses between a tool electrode and a workpiece across a machining gap flushed with a machining fluid, comprising the steps of:

generating a high-frequency alternating electric power in a high-frequency generator unit disposed remote from said machining gap;

transmitting said high-frequency alternating electric power to a region immediately proximal to said machining gap along a coaxial feeder cable having inlet terminals directly leading from said unit and outlet terminals having a primary winding of a transformer in said region;

transforming the transmitted high-frequency alternating electric power to produce a transformed high-frequency alternating electric power at a secondary winding of said transformer in said region;



rectifying directly said transformed high-frequency alternating electric power by a rectifier disposed in said region and connected directly to said electrode and said workpiece via respective conductors of a minimum length to form a succession of pulses of a given polarity relative to said tool electrode and said workpiece, constituting said electrical discharge machining pulses; and

dimensioning said conductors and the distance of said region from said gap such that there is little loss of power due to stray resistance and inductance in said conductors and the pulse waveform across said gap is substantially free from distortion.

4,277,669

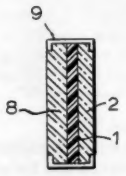
METHOD AND DEVICE FOR DETECTING THE THRESHOLD OF GENERATION OF A LASER BEAM

Robert R. Alfano, Riverdale, and Norman H. Schiller, Whitestone, both of N.Y., assignors to Hamamatsu T.V. Co, Ltd, Hamamatsu, Japan

Filed Jul. 6, 1979, Ser. No. 55,145

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LK **12 Claims**

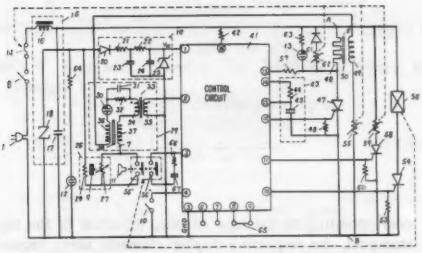


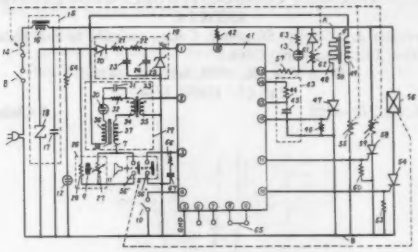
1. A laser threshold detecting device comprising a layer of burnable material held by a backing layer of non-burnable material, said burnable and non-burnable being by a laser beam generated by a laser, and covered by a transparent layer, said transparent layer and said layer of burnable material being larger in area than the cross section of said laser beam whose threshold of generation is being detected, and means for holding said transparent layer closely adjacent to said layer of burnable material, whereby said device is insertable into the beam path of a laser being tested, said beam upon generation then passing through said transparent layer and impinging upon the layer of burnable material to cause vaporization thereat to a depth of the entire burnable layer at points of contact and said transparent layer acting to prevent the vaporized material from escaping into the surrounding atmosphere.

4,277,670
TEMPERATURE CONTROL SYSTEM FOR ELECTRIC HEATING APPARATUS

Shun'ichiro Mori, Koriyama; Kunio Kimata, Kyoto; Hirofumi Aoygi, Habikino; Hiroshi Horii, Kashihara, and Hidenobu Hasegawa, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 18, 1979, Ser. No. 31,072
Claims priority, application Japan, Apr. 20, 1978, 53-47312
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—492 **9 Claims**





1. A temperature control system comprising a heat generating load for an article to be heated, a power control element for controlling power supply to the heat generating load, a temperature detecting circuit for producing an ON signal when the temperature detected by a temperature sensor for receiving the heat of the heat generating load is lower than a temperature set by a temperature setting unit and for producing an OFF signal when the detected temperature has reached the set temperature, and a control circuit for feeding an ON or OFF signal to the power control element in response to said ON or OFF signal from the temperature detecting circuit, the control circuit having a hysteresis control circuit which actuates a timer when the signal from the temperature detecting circuit has changed from an ON signal to an OFF signal or from an OFF signal to an ON signal to permit the power control element to receive OFF signals while the timer is in operation despite ON signals emitted from the temperature detecting circuit and to receive an ON signal in response to an ON signal from the temperature detecting circuit after lapse of the time set by the timer until the temperature detected by said temperature sensor has reached the set temperature, whereby to render the temperature of the article to be heated swingable over a predetermined range in repetitive cycles.

4,277,671
TEMPERATURE CONTROL SYSTEM FOR ELECTRIC HEATING APPLIANCE

Shunichiro Mori, Koriyama; Kunio Kimata, Kyoto; Hirofumi Aoyagi, Habikino; Hiroshi Horii, Kashihara, and Hidenobu Hasegawa, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

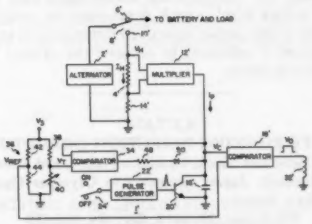
Filed Apr. 18, 1979, Ser. No. 31,300
Claims priority, application Japan, Apr. 20, 1978, 53-47312
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—494 **4 Claims**

1. A temperature control system comprising a heat generating load, a power control element for directly or indirectly supplying current to the heat generating load, a temperature detecting circuit for emitting an ON signal when the temperature detected by a temperature sensor in thermally coupled relation with the heat generating load is lower than a set temperature and emitting an OFF signal when the detected temperature is higher than the set temperature, and a control circuit for feeding an ON or OFF signal to the power control element in response to said ON or OFF signal from the temperature detecting circuit, the control circuit having a failure detecting circuit for logically comparing the signal from the temperature detecting circuit with the terminal voltage across the power control element to produce output when the power control element is in conduction because of self-triggering although the signal from the temperature detecting circuit is an OFF signal, the control circuit further being provided with a safety circuit for stopping power supply to the heat generating load in response to the output from the failure detecting circuit, said failure detecting circuit including a wave form shaping unit for detecting the ON or OFF output of the temperature detecting circuit during a negative cycle of an a-c power supply of opposite polarity to the power control element to produce ON or OFF output during the following positive half cycle in accordance with the detected output, and a terminal voltage detecting unit for detecting the terminal voltage across the power control element to detect whether the power control element is in conduction or out of conduction during a first detecting period, the failure detecting circuit being adapted to compare the ON or OFF signal from the wave form shaping unit with the output from the terminal voltage detecting unit during a second detecting period of later phase than the first period.

4,277,672
CONTROL CIRCUIT FOR CONTROLLING QUANTITY OF HEAT TO ELECTRICALLY HEATABLE WINDSHIELD

Dwight V. Jones, Baldwinsville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,218
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—497 **8 Claims**



1. A heater control circuit for an automotive electrical system that includes an electric alternator which supplies power to window heater means during controlled heating periods for window deicing purposes, said control circuit comprising:

(a) first means for generating a first output that is a function of the power supplied to said heater means by said alternator during said controlled heating periods,

(b) temperature sensor means for sensing the ambient temperature,

(c) second means, including said temperature sensor means,

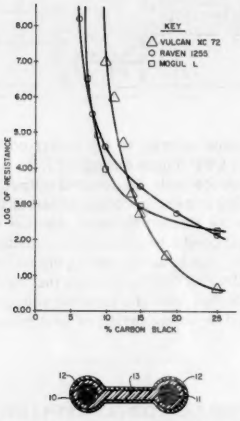
for generating a second output that is a function of the temperature difference between said ambient temperature and a deicing temperature, and

(d) third means, responsive to said first and second outputs and exhibiting an electrical response corresponding to the thermal response of the window, for generating a third output as a function of time for controlling the duration of said heating periods, whereby there is supplied to said heater means a quantity of heat sufficient to provide deicing of the window.

4,277,673
ELECTRICALLY CONDUCTIVE SELF-REGULATING ARTICLE

Cornelius J. N. Kelly, Simsbury, Conn., assignor to E-B Industries, Inc., Simsbury, Conn.

Filed Mar. 26, 1979, Ser. No. 24,063
Int. Cl.³ H05B *3/34*
U.S. Cl. 219—528 **5 Claims**



1. An electrically conductive self-regulating in watts per unit length article comprised of at least two spaced elongated electrodes electrically inter-connected by and embedded in a self-regulating semi-conductive composition exhibiting a positive temperature coefficient of electrical resistance containing carbon black dispersed in a polymeric matrix having at least 20% crystallinity as determined by X-ray diffraction, the improvement wherein the carbon black comprises a high electrical resistivity carbon black which percentage by weight of the total weight of the semi-conductive composition is at least 6% which amount is sufficient to achieve the critical level for electrical conductivity.

4,277,674
TAPE RUNNING DIRECTION INDICATOR

Masanobu Sato; Ken Satoh; Toshihiro Nakao, and Kenzi Furuta, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1978, Ser. No. 936,689
Claims priority, application Japan, Sep. 30, 1977, 52-117560
Int. Cl.³ G06M *3/14*; H03K *21/00*
U.S. Cl. 235—92 EA **15 Claims**

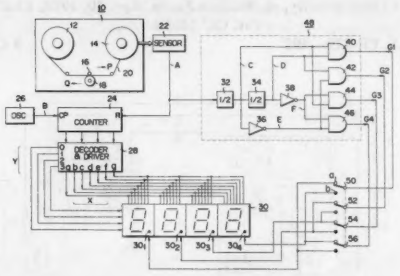
1. A tape running direction indicator comprising:

a tape transport; a display means in which a plurality of digit display sections including display elements are arranged side by side;

sensing means coupled to the tape transport for providing a sensing signal for making an indication corresponding to the tape running direction;

running indication signal generating means operatively connected to said sensing means for sequentially providing running indication signals corresponding to the tape running direction on the basis of the sensing signal; and

drive means for driving at least one display element included in each of the digit display sections in accordance with the running indication signals in order to make an indication

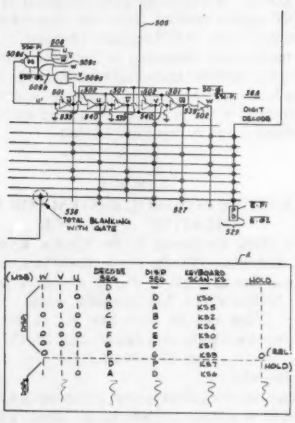


corresponding to the tape running direction in the tape transport, the respective display elements being sequentially energized in accordance with the running indication signals which are shifted one by one in order that the energization of the display element is progressively shifted in a direction corresponding to the tape running direction.

4,277,675
NON-SEQUENTIAL COUNTER

Clarence Y. Mar, and Michael J. Caruso, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 901,894, May 1, 1978, abandoned, which is a continuation of Ser. No. 735,917, Oct. 27, 1976, abandoned. This application Mar. 23, 1979, Ser. No. 23,369
Int. Cl.³ H03K *23/22*
U.S. Cl. 235—92 MB **5 Claims**



1. A non-sequential counter having 2^N unique states, said counter being responsive to an incrementing signal for changing the state of said counter, said counter comprising:

(a) 2 N inverters

(b) gating means interconnecting said inverters in series to form an N-stage shift register for storing N bits of data, said gating means being responsive to said incrementing

signal for causing the data stored in said shift register to shift; and

(c) feedback logic means responsive to the output of each of said inverters and to said incrementing signal for inserting into a first stage of the shift register a bit corresponding to the least significant bit of the next state to be generated by the counter, a logical one bit being inserted into said first stage in response to a first $2^N/2$ binary output states of said inverters and a logical zero being inserted into said first stage in response to a second $2^N/2$ binary output states of said inverters.

4,277,676

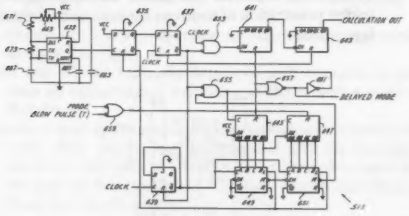
APPARATUS FOR MEASURING THE FALL HEIGHT OF A PILE DRIVER RAM

Otto W. Kammerer, Houston, Tex., assignor to Pileco, Inc., Houston, Tex.

Filed May 7, 1979, Ser. No. 36,546

Int. Cl.³ G06M *3/06*

U.S. Cl. 235—92 PD **10 Claims**



1. An apparatus for metering the stroke of a pile driving hammer where each blow delivered by such hammer produces a discrete sound and where the stroke for a particular blow is a fixed function of the time differential between such blow and the immediately preceding blow, the apparatus comprising:

detection means for converting the sound produced by each blow of such hammer into an electrical pulse such that the time differential between consecutive electrical pulses is substantially equal to the time differential between the consecutive blows of such hammer corresponding to such electrical pulses, said detection means including an output at which such electrical pulses are provided; and

computing means for providing a digital indication having a magnitude, said magnitude being a fixed function of the time differential between one of the electrical pulses provided by said detection means and the immediately preceding electrical pulse provided by said detection means, the functional relationship of said magnitude to such electrical pulse time differential being the same as the functional relationship of the stroke of such hammer for a particular blow to the time differential between such blow and the immediately preceding blow.

4,277,677

MECHANICAL COUNTER

Hans Neher, Hausen am Tann, Fed. Rep. of Germany, assignor to J. Hengstler K.G., Aldingen, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,443

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1978, 2828907

Int. Cl.³ G06C *27/00*; G06F *15/18*

U.S. Cl. 235—109 **14 Claims**

1. In a mechanical counter comprising a plurality of presettable digit wheels, each of which is rotatable on a first axis to a plurality of preset positions corresponding to respective values of an associated digit position of a preselected count, retaining means for retaining said presettable wheels in said preset positions during a counting operation of the counter, and a signal generator comprising axially movable cam follower means arranged to generate a signal when said counter has counted to said preselected count, the improvement which comprises

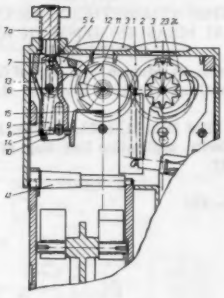
a plurality of presetting members, which are associated with respective ones of said presettable wheels,

a stationary pivot on which said presetting members are pivoted,

a guide member which engages said presetting members at portions thereof which are remote from said pivot and which is pivotally movable between first and second positions to move said presetting members about said pivot out of and into engagement with said presettable wheels,

first spring means adapted to urge said guide member to said first position,

said presetting members being displaceable relative to said pivot and said guide member to rotate said presettable



wheels when said presetting members are in engagement with said presettable wheels,

a plurality of indicating wheels are rotatably mounted on a second axis, which is parallel to and spaced from the first, and are associated with respective digit positions and rotatable to a plurality of count-indicating positions,

each of said presettable wheels having on one side a hub and an end face formed with a cam recess,

a set of first gears are arranged to rotate on said second axis in unison with respective ones of said indicating wheels, and

said signal generator comprises a set of second gears, which are associated with respective ones of said presettable wheels and rotatably mounted on the hubs thereof and in mesh with respective ones of said first gears, each of said second gears having a hub, which axially protrudes on the same side as the hub of the associated presettable wheel.

4,277,678

METHOD AND APPARATUS FOR TESTING CIGARETTES OR THE LIKE

Günter Wahle, Reinbek, and Uwe Heitmann, Schwarzenbek, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co Kg., Hamburg, Fed. Rep. of Germany

Filed Sep. 11, 1979, Ser. No. 74,330

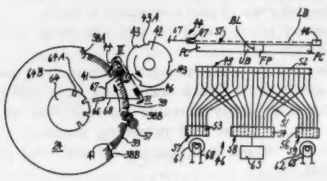
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1978, 2840617

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—223 R **18 Claims**

1. A method of testing successive rod-shaped articles which constitute or form part of smokers' products, comprising the steps of conveying the articles seriatim sideways along a prede-

termined path; decelerating successive articles in a predetermined portion of said path and rotating the decelerated articles



about their respective axes; and optoelectrically scanning each article in the course of the corresponding rotating step.

4,277,679

APPARATUS AND METHOD FOR CONTACT-FREE POTENTIAL MEASUREMENTS OF AN ELECTRONIC COMPOSITION

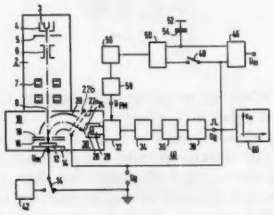
Hans P. Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 105,892

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1979, 2903077

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—310 **7 Claims**



1. A method for contact-free potential measurement of an electronic component with an electron microscope by means of measuring the energy of the secondary electrons with a spectrometer having a compensating circuit with a controlled-gain amplifier and to which a photomultiplier is connected, comprising the steps of connecting the measuring point of the component (12) to a pre-determined potential; and setting the output voltage (U_{R1}) of the controlled-gain amplifier (38) to a pre-determined index value (U_S) with the control of the photomultiplier voltage (U_{PM}); and holding the photomultiplier voltage (U_{PM}) constant and, subsequently applying an operating voltage to the component (12) and determining the measured voltage (U_m) from the difference ($U_R - U_S$) between the control unit output voltage (U_R) and the index value (U_S).

4,277,680

NEUTRON POISON TEST DEVICE FOR HIGH DENSITY SPENT FUEL STORAGE RACKS

Luis F. Rodriguez, 1019 N. 63rd St., Philadelphia, Pa. 19151, and Thomas J. Crawford, 430-B Whitman Dr., Haddonfield, N.J. 08033

Filed Apr. 9, 1979, Ser. No. 28,001

Int. Cl.³ G01N *23/00*; G21F *5/02*

U.S. Cl. 250—358 R **8 Claims**

1. A neutron poison-can test device for determining whether the storage cavities of highdensity spent nuclear fuel storage racks contain neutron poison, said test device comprising:

a. a neutron source can comprising;

a-1 a source can housing having a square cross-section and size corresponding to but sufficiently smaller than that of the storage cavities of said storage racks to permit insertion of said can into said cavities;

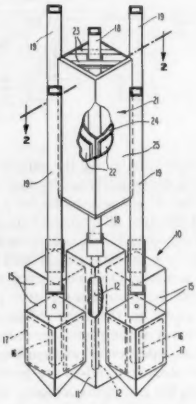
a-2 a source of neutrons contained within said source-can housing; and a sectioned and layered arrangement of neutron moderating material and borated neutron moderating material as required for moderation and shielding, forming four windows of limited size leading to the four sidewalls of the source can;

a-3 a cylindrical tube for containing the neutron source and facilitating rapid removal and insertion of the source in order to reduce doses that would be received from handling the bare source;

b. a shield slidable over said source can, said shield comprising:

b-1 a housing having a hollow square cross-section and having a size sufficiently larger than that of said source can to allow said shield to slide over said source can; and

b-2 four thermal neutron shielding plates, held in the hollow portion of said housing, one located against each of the four walls of said shield housing, thereby to inhibit penetration of neutrons through said shield housing;



c. four detector cans symmetrically disposed about said source can, each of said detector cans comprising;

c-1 a can housing having a square cross section and size corresponding to but sufficiently smaller than said cavities of said storage racks to permit insertion of said can into said cavities;

c-2 a thermal neutron detector contained in a tube mounted within said can; and

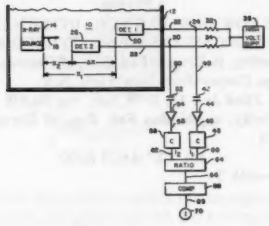
c-3 thermal neutron absorbing material at all sidewalls of the detector can except the sidewall facing said source can;

d. a plurality of five elongated tubes for individually supporting said source can and four detector cans at the lower ends of said tubes in such configuration that when said source can is inserted into the upper end of a storage cavity of said storage rack, the four detector cans enter the four cavities adjacent to said cavity, said slidable source-can shield being prevented from entering into said cavity because of its larger size, said slidable shield remaining on the upper surface of said storage rack as said test device is lowered through said cavity and the four cavities adjacent thereto.

4,277,681
LOW RADIATION DENSITOMETER

Richard J. Borken, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 4, 1979, Ser. No. 81,962
Int. Cl.³ G01N *23/00, 21/01*
U.S. Cl. 250—358 R 13 Claims



1. Apparatus for measuring fluid density comprising, in combination:

a source of radiation operable to emit radiation generally along a first path;

first and second radiation detectors each operable to produce an output signal indicative of the radiation received thereby;

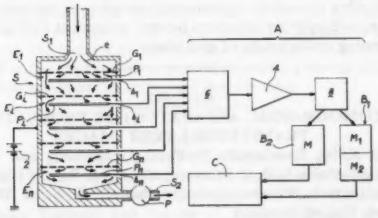
means mounting the source and the radiation detectors in the fluid whose density is to be measured with the first detector in the first path at a first distance from the source and the second detector in the first path at a second distance from the source; and

ratio means connected to the radiation detectors to receive the output signals therefrom and to produce a ratio signal which varies with the density of the fluid.

4,277,682
DEVICE FOR ANALYZING THE ACTIVITY OF A RADIOACTIVE AEROSOL AS A FUNCTION OF THE GRAIN SIZE DISTRIBUTION OF ITS PARTICLES

Guy Madelaine, Villebon sur Yvette, and Michel Pourprix, L'Ha les Roses, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 27, 1979, Ser. No. 61,174
Claims priority, application France, Aug. 29, 1978, 78 24885
Int. Cl.³ G01T *1/18*
U.S. Cl. 250—380 4 Claims

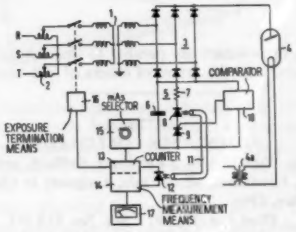


1. A device for analyzing the activity of a radioactive aerosol containing particles of different grain sizes, as a function of the grain size distribution of said particles, said device comprising a tight enclosure, means for circulating the aerosol through and within said enclosure, a plurality of stages defined within said enclosure, for collecting aerosol particles of varying grain size, each of said stages comprising an aerosol injection plate perforated by at least one opening calibrated to prevent passage of those of said particles having a grain size greater than a predetermined grain size and a collection plate for said particles, means for establishing an electric field between the injection and collection plates of each of said respective stages to establish an ionization current through each of said stages during the disintegration of the particles collected in a stage to be analyzed, and means for measuring the ionization current of each of said stages.

4,277,683
X-RAY DIAGNOSTIC GENERATOR WITH A MEASURING ARRANGEMENT FOR THE X-RAY TUBE CURRENT

Herbert Schmitmann, Uttenreuth-Weiher, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,300
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1978, 2849979
Int. Cl.³ H05G *1/00, 1/30*
U.S. Cl. 250—402 4 Claims



1. An x-ray diagnostic generator with a measuring arrangement for the x-ray tube current in the high voltage circuit, characterized in that the measuring arrangement comprises a frequency converter (5) having a light source (8) that emits light pulses whose frequency corresponds to the x-ray tube current, and an opto-electric transducer (12); and in that a light conductor (11) leads from the light source (8) to the opto-electric transducer (12), frequency measurement means being coupled with the opto-electric transducer (12) for providing a measure of x-ray tube current.

4,277,684
X-RAY COLLIMATOR, PARTICULARLY FOR USE IN COMPUTERIZED AXIAL TOMOGRAPHY APPARATUS

Arthur N. Carson, West Hartford, Conn., assignor to U.S. Philips Corporation, New York, N.Y.

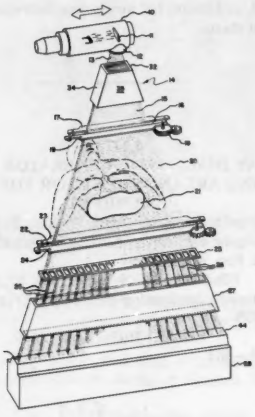
Filed Aug. 18, 1977, Ser. No. 825,590
Int. Cl.³ G01N *21/00*
U.S. Cl. 250—445 T 21 Claims

1. A collimator for accepting a divergent input beam from a radiation source and for producing therefrom a thick, substantially planar swath of radiation which impinges upon an array of radiation detectors; a central line connecting the center of the source to the center of the array and a beam path being defined by all points which lie on lines connecting points on said source to points on said array, comprising:

baffle means, surrounding a limited portion of said beam path and defining a central perforation on said path, which function to absorb radiation propagating outside of said path; and

a plurality of planar, radiation-absorbing laminae, disposed

within said perforation substantially parallel to the plane of said swath, the extent of ones of said laminae, measured



along lines which are parallel to said central ray, being different than the extent of others of said laminae.

4,277,685

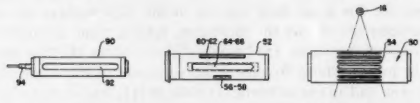
ADJUSTABLE COLLIMATOR

John Covic, Wickliffe; Glen Leininger, Suffield, and Roland W. Carlson, Lyndhurst, all of Ohio, assignors to Ohio-Nuclear, Inc., Solon, Ohio

Filed Jun. 12, 1978, Ser. No. 914,361

Int. Cl.³ G03B *41/16*; G21F *5/04*

U.S. Cl. 250—445 T **28 Claims**



1. An adjustable collimator for forming a fan beam of x or gamma radiation with an adjustable fan angle and thickness comprising:

(a) an inlet opening for receiving a beam of the radiation;

(b) a first generally cylindrical member having a first plurality of slots therein and first non-restrictive passages means, said first plurality of slots comprising slots of more than one length each shorter than the inlet opening and the first non-restrictive passage means, said first non-restrictive passage means being disposed generally 180° around the first cylindrical member from each of the first plurality of slots, said first cylindrical member being disposed adjuacent said inlet opening and mounted for rotatinal movement to bring different ones of said first plurality of slots generally in line with the inlet opening, whereby aligning one of the first plurality of slots with the inlet opening selects the fan angle of the beam;

(c) a second generally cylindrical member having a second plurality of slots therein and second non-restrictive passage means, said second plurality of slots comprising slots of more than one width, each narrower than the inlet opening, the first plurality of slots and the first and second non-restrictive passage means, said second non-restrictive passage means being disposed generally 180° around the second cylindrical member from each of the second plurality of slots, said second cylindrical member being disposed concentric with said first cylindrical member and mounted for rotational movement to bring different ones of the second plurality of slots generally in line with the inlet opening, whereby aligning one of the second plurality of slots with the inlet opening selects the thickness of the fan beam; and

(d) control means for rotating said first and second cylindrical members to select the fan angle and thickness of the fan beam.

4,277,686

DEVICE FOR DETERMINING INTERNAL BODY STRUCTURES BY MEANS OF SCATTERED RADIATION

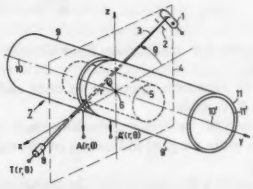
Geoffrey Harding, Rellingen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1979, Ser. No. 56,479

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831311

Int. Cl.³ A61B *6/00*

U.S. Cl. 250—445 T **5 Claims**



1. A device for determining the internal structure of a flat examination zone of a body comprising radiation means for emitting a primary radiation beam in a plane of the examination zone, said beam having a small cross-section, said radiation means being displaceable in said plane in a direction transversely of the direction of said primary radiation beam, and being rotatable about an axis extending perpendicular to said plane; detector means for generating measuring signals by detection of radiation emerging from the body, said detector means being free of said primary radiation beam and situated at least on one side of said plane to detect scattered radiation generated by said primary radiation beam so that scatter signals are obtained which are associated with the beam path, said detector means at least partly enclosing said body; calculating means for calculating a distribution of scatter coefficients in said plane from said scatter signals; and display means for displaying the internal structure, CHARACTERIZED IN THAT said detector means comprises two identical, hollow-cylinder detectors which together substantially completely envelop said body and which are arranged at a distance from each other in a mirror-symmetrical image with respect to said plane, said cylinder detectors having coincident cylinder axes extending transversely of said plane.

4,277,687

TOMOGRAPHIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

Klaus Killig, Hoechstadt; Wolfhart Lichtenberg, and Rudolf Schittenhelm, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,064

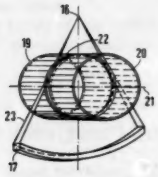
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850675

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—445 T **3 Claims**

1. A tomographic apparatus for producing transverse layer images of a radiography subject, having a radiation measuring arrangement which contains both a radiation source producing a beam of rays which penetrates the radiography subject and whose cross sectional extent perpendicular to the layer plane is equal to the layer thickness, and a radiation receiver which determines the radiation intensity behind the subject, and also

having means for producing rotational displacement of the beam of rays for irradiating the radiography subject from different directions, and having a measured value converter for transforming the signals supplied by the radiation receiver into a layer image, characterized in that two hollow cylinders (**19, 20**) are disposed between the radiation source (**16**) and the



radiation receiver (**17**) and into which the radiography subject may be introduced, said cylinders (**19, 20**) having substantially the same diameter, having substantially a common axis (**21**) and being comprised of a radiation-absorbing material except at a gap (**22**) therebetween left free for the passage of the x-ray beam (**23**).

4,277,688

CASK BAGGING DEVICE

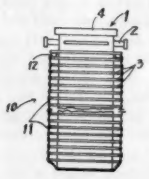
Masahiko Yamamoto, and Yoshinori Nishino, both of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan

Filed May 15, 1979, Ser. No. 39,152

Claims priority, application Japan, May 15, 1978, 53-65341[U]; Jan. 23, 1979, 54-06732; Jan. 29, 1979, 54-09331

Int. Cl.[3] **G21F** *5/00*

U.S. Cl. 250—506 **14 Claims**



1. In a cask bagging device including an open-ended bag for covering the outer surface of a cask to protect the same from contamination, the improvement comprising a flexible annular tube extending about the open end of the bag to hold said open end in sealed relation to the cask, means for feeding a gas pressure to the interior of said annular tube, and a system for controlling the gas pressure in accordance with external water pressure at a position close to said annular tube.

4,277,689

DOCUMENT READER

Robert J. Thomas, Spokane; Michael Piekarski, Otis Orchards; Gary B. Morgan, Spokane; John Rank, Spokane; William O. Thurman, Spokane, and Donald C. Lerch, Spokane, all of Wash., assignors to Key Tronic Corporation, Spokane, Wash.

Filed Dec. 12, 1979, Ser. No. 102,665

Int. Cl.[3] **G06K** *9/00*

U.S. Cl. 250—567 **2 Claims**

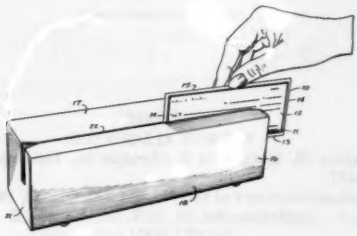
1. In an apparatus for reading a longitudinal strip of visual indicia containing discrete alpha-numeric characters located along the face of a document, wherein the document has a constant thickness and its face is bounded along one side by a planar longitudinal reference edge, the document having a predetermined width dimension perpendicular to the reference edge, the strip of visual indicia being located within transversely spaced boundaries parallel to one another and to the reference edge of the document;

a frame;

an elongated document slot formed through the length of the frame;

said document slot being bounded by a pair of opposed walls on said frame having opposed inner surfaces spaced apart to freely receive the thickness of a document between them, said walls having coplanar longitudinal edges and outer ends;

said document slot also being bounded by a base on said frame that extends between said pair of walls at a location spaced inwardly from the longitudinal edges of the walls a distance less than the document height;



whereby a document can be manually moved in a longitudinal direction within the document slot with respect to the frame, the document being hand-held and guided by sliding engagement of the base by the reference edge of the document;

viewing means mounted to one of the walls for reflecting light along a scan line intersecting the path of the strip of visual indicia on a document within the document slot;

optical character scanning means on said frame for electronically generating images of each alpha-numeric character as it traverses the scan line; and

recognition processing means on said frame operatively connected to the character scanning means for analyzing the electronic images generated thereby and for encoding the images into a machine readable code.

4,277,690

PLANT FOR UTILIZING KINETIC ENERGY

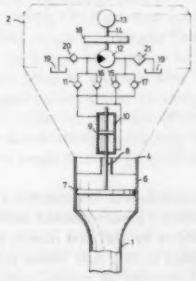
Sven A. Noren, Klövervägen 3, Bromma, Sweden (S-161 36)

Filed Aug. 7, 1979, Ser. No. 64,351

Claims priority, application Sweden, Aug. 16, 1978, 7808679

Int. Cl.[3] **F03B** *13/12*

U.S. Cl. 290—53 **5 Claims**



1. Plant for utilizing kinetic energy inherent in the wave movement of water or heaving of the sea, comprising a float

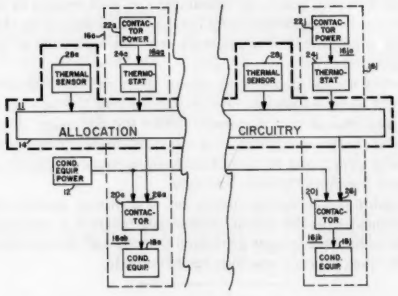
unit and a depending energy absorption apparatus connected to the float unit, characterized in that the energy absorption apparatus comprises an immersed piston built into an elongate, substantially vertical acceleration pipe, said pipe comprising a cylinder for said piston and being open at both ends and normally submerged beneath the float unit when in use, said pipe being connected to the float unit and accompanying the float unit in the wave movement of the water, said piston being reciprocable in said pipe in response to hydraulic pressure forces on its upper and lower faces, and being unrestrained exteriorly of the plant against movement with or relative to said pipe.

4,277,691

ENERGY ALLOCATOR

Lawrence M. Lunn, 6902 S. Meridian St., Indianapolis, Ind. 46217

Continuation-in-part of Ser. No. 841,840, Oct. 13, 1977. This application Jun. 14, 1979, Ser. No. 48,615
Int. Cl.³ H02J *3/00*
U.S. Cl. 307—35 **28 Claims**



1. A system for allocating energy, adapted to be coupled to a plurality of conditioning equipment systems, each altering a corresponding one of a plurality of first conditions in response to a corresponding one of a plurality of first signals comprising:

first means for developing, in the absence of a second signal, a plurality of third signals in an order determined by the relative deviation of each of said plurality of corresponding first conditions from each of a plurality of corresponding predetermined second conditions; and for developing, in the absence of said second signal and in a controlled order, those of said plurality of third signals identifying those of said plurality of corresponding first conditions having substantially the same deviation from corresponding ones of said plurality of predetermined second conditions; and for developing a fourth signal in response to said second signal;

second means coupled to said first means for developing said second signal when a predetermined number of said third signals is developed by said first means; and

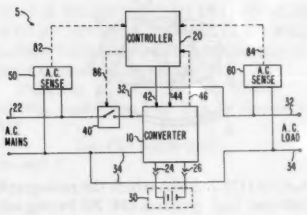
third means, coupled to said first means and adapted to be coupled to said plurality of conditioning equipment systems for developing, in response to said fourth signal, said plurality of first signals corresponding to said third signals developed, in the absence of said second signal, by said first means.

4,277,692

CONTINUOUS POWER SOURCE WITH BI-DIRECTIONAL CONVERTER

Kenneth T. Small, Cupertino, Calif., assignor to Tab Products Company, Palo Alto, Calif.

Filed Jun. 4, 1979, Ser. No. 45,573
Int. Cl.³ H02J *9/00*
U.S. Cl. 307—66 **5 Claims**



1. An apparatus having first and second DC power terminals for use in transferring electric power between an AC power system and a DC power storage device, such as a battery, said apparatus comprising:

a push-pull transformer having a first winding for interfacing with said AC power system, and a second winding, said second winding having a first end tap, a second end tap and a center tap, said center tap being coupled to said first DC power terminal;

a flux storage transformer capable of storing flux for a period which is large compared to a switching frequency of current through said flux storage transformer comprising a third winding and a fourth winding, said third winding being in a first current path with third and fourth end taps and said fourth winding being in a second current path with fifth and sixth end taps, said third and fifth end taps having the same polarity, said third end tap being coupled in said first current path to said first end tap of said push-pull transformer and said sixth end tap being coupled in said second current path to said second end tap of said push-pull transformer, said fourth end tap being coupled in said first current path to said second DC power terminal and said fifth end tap being coupled in said second current path to said second DC power terminal;

first bi-directional switching means in said first current path;

second bi-directional switching means in said second current path;

means for pulse width modulating said first switching means and said second switching means on and off to direct current flow in said first and second current paths in a first direction to said first and second DC power terminals;

said first and second switching means each including a diode which is responsive to a forward bias in said first and second current paths, respectively, to permit current flow only in a second direction in said first and second current paths, respectively, through said first and second DC power terminals, said second direction being the reverse of said first direction;

said modulating means being constrained to modulate only said first switching means or only said second switching means so as to define a permissable current path alternately

(a) from said second DC power terminal in said first direction through said first current path into said third winding of said flux storage transformer in order to generate a flux, which, upon opening of said first switching means, induces a current in said fourth winding in said second direction through said second current path back to said second DC power terminal without reversing current flow polarity in said first winding of said push-pull transformer, or

(b) from said second DC power terminal in said first

direction through said second current path to said fourth winding of said flux storage transformer in order to generate a flux, which, upon opening of said second switching means, induces a current in said third winding in said second direction through said first current path back to said second DC power terminal without reversing current flow polarity in said first winding of said push-pull transformer,

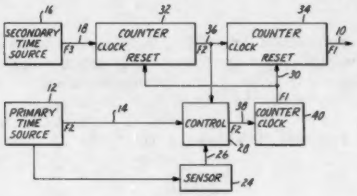
such that the duty cycles of said switching means determine whether net DC power flow is from or to said DC power terminals.

4,277,693

APPARATUS FOR PROVIDING A TIME CONTROLLED OUTPUT

Earl B. Hoekman, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 16, 1979, Ser. No. 94,925
Int. Cl.³ H01H *43/00*
U.S. Cl. 307—141 **17 Claims**



1. An apparatus for providing a time controlled output at a first frequency based primarily upon a primary time source providing a primary time signal at a second frequency which is equal to or greater than said first frequency, comprising:

an oscillator producing an oscillator time digital signal at a third frequency which is equal to or greater than said second frequency;

a counter coupled to said oscillator time digital signal for counting a predetermined number of pulses of said oscillator time digital signal and producing as an output said time controlled output, said counter having a provision for being reset;

a primary time sensor coupled to said primary time source providing a primary time operative signal indicative of said primary time source being operative; and

a control circuit coupled to said time controlled output, coupled to said primary time signal and coupled to said primary time operative signal, said control circuit producing a reset signal responsive to said primary time signal when said primary operative time signal indicates said primary time source is operative and responsive to said time controlled signal when said primary time operative signal indicates said primary time source is not operative;

said reset signal being operatively coupled to said counter providing said provision for being reset;

whereby said time controlled output is synchronized by said primary time source when said primary time source is operative and is synchronized by said oscillator when said primary time source is not operative.

4,277,694

CHARGE COUPLED DEVICE VARIABLE DIVIDER WITH INTEGRATING WELL

William E. Jensen, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 1, 1979, Ser. No. 80,848
Int. Cl.³ G11C *19/28*; H01L *29/78*
U.S. Cl. 307—221 D **10 Claims**

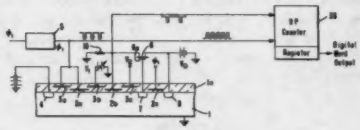
1. A charge coupled device variable ratio divider formed on a semiconductive substrate and controlled by a clock signal means utilizing regenerative charge coupled feedback, comprising:

charge injection means for sequentially injecting charge packets of a preselected size into said charge coupled device in synchronism with said clock signal means;

means for varying said preselected size;

charge integration electrode means for accumulating a limited predetermined number of said injected charge packets in the surface of said substrate;

floating conductor means for sensing overflow of charge



from said integration means upon accumulation of said predetermined number;

charge coupled regenerative feedback means for forcing said charge packets accumulated by said integration means to overflow from said integration means in response to said floating conductor means for sensing overflow; and

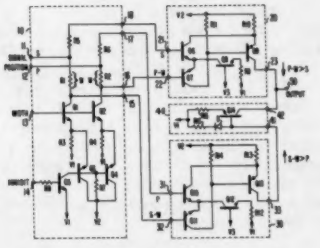
means responsive to said charge coupled regenerative feedback means for generating a frequency divided clock signal having a frequency divided down from the frequency of said clock signal means by a ratio determined by said preselected size varying means.

4,277,695

AMPLIFIER HAVING DEAD ZONE OF CONTROLLABLE WIDTH AND POSITION

James A. Wilber, Indianapolis, Ind., and Bernard J. Yorkanis, South Plainfield, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 16, 1979, Ser. No. 58,022
Int. Cl.³ H03K *5/08, 5/24*
U.S. Cl. 307—542 **10 Claims**



1. A dead zone amplifier for supplying output current in a given sense to a load when an input signal is above a first level and for supplying output current in the opposite sense to said load when said input signal is below a second level, said levels defining a dead zone within which no output current flows in either sense to said load, said dead zone amplifier comprising:

an input circuit responsive to an input signal and a width control signal for providing a first composite output signal representative of the sum thereof, said input circuit being also responsive to said width control signal and a position

control signal for providing a second composite output signal representative of the sum thereof;

a first differential amplifier responsive to said input signal and said second composite output signal for producing a first output current of a given sense when said input signal and said second composite output signal are of first relative magnitudes, said first output current being zero otherwise;

a second differential amplifier responsive to said position signal and said first composite output signal for producing a second output current of said given sense when said position control signal and said first composite signal are of first relative magnitudes, said second output current being zero otherwise; and

an output circuit for subtracting one of said output currents from the other to produce a difference current for application to said load, whereby the position and width of said dead zone are independently and non-interactively controllable in response to changes in said position and width control signals.

4,277,696

SEMICONDUCTOR SWITCH CIRCUIT

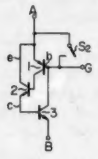
Michio Tokunaga, Zushi, and Junjiro Kitano, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1979, Ser. No. 27,838

Claims priority, application Japan, Oct. 13, 1977, 52-122600

Int. Cl.³ H03K *17/60*

U.S. Cl. 307—255 **8 Claims**



1. A semiconductor switch circuit comprising:

an inverted Darlington circuit including at least a first and a second transistor which are complementary to each other, the emitter of said first transistor being connected to the collector of said second transistor and the base of said second transistor being connected to the collector of said first transistor in a manner so that the emitter of said first transistor and the collector of said second transistor comprises an equivalent emitter of said inverted Darlington circuit, and that the emitter of said second transistor comprises an equivalent collector of said inverted Darlington circuit, and that the base of the first transistor comprises an equivalent base of said inverted Darlington circuit;

a third transistor having a base and a collector connected to the equivalent collector and base of said inverted Darlington circuit, correspondingly and respectively, thereby to constitute a positive feedback circuit therebetween; and

means for executing on-off control of at least a selected one of said first and second transistors constituting said inverted Darlington circuit.

4,277,697

DUTY CYCLE CONTROL APPARATUS

George R. Hall, Sherman Oaks, and Robert J. Hall, Chatsworth, both of Calif., assignors to Norlin Industries, Inc., White Plains, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,585

Int. Cl.³ H03K *5/26, 3/017*

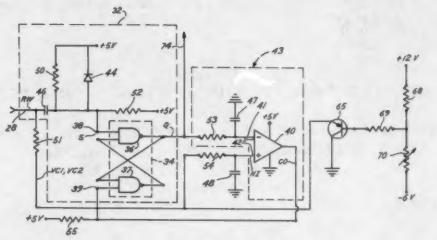
U.S. Cl. 307—265 **11 Claims**

1. Apparatus for controlling the duty cycle of an input signal having a period, said apparatus comprising:

control means for controlling the amplitude of the input signal;

means responsive to the controlled input signal for generating a first reference signal having a first amplitude dependent on the period of the controlled input signal;

generator means for initiating in synchronism with the input signal an output signal having a pre-determined second amplitude; and



comparator means for enabling the generator means to terminate the output signal after a time period related to the relative amplitudes of the reference signal and the output signal, whereby the duty cycle of the output signal with respect to the input signal remains constant even though the frequency of the input signal changes.

4,277,698

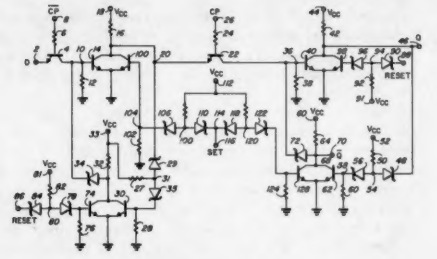
DELAY TYPE FLIP-FLOP

Ray M. Vasquez, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 1, 1979, Ser. No. 44,448

Int. Cl.³ H03K *3/289*

U.S. Cl. 307—272 A **4 Claims**



1. A master-slave delay type flip-flop having a first input, a first non-inverted output and a first inverted output for receiving logical data at said first input and transferring said logical data to said first inverted and non-inverted outputs, said flip-flop being responsive to a clock signal capable of assuming first and second voltage levels, comprising:

a first transistor having an emitter coupled to said first input and a base coupled to said clock signal for transferring said data to its collector when said clock signal assumes said first voltage level;

a second transistor having an emitter coupled to ground and a base coupled to the collector of said first transistor for inverting said data at its collector;

a third transistor having an emitter coupled to the collector of said second transistor and a base coupled to said clock signal for transferring the inverted data to its collector when said clock signal assumes said second voltage level;

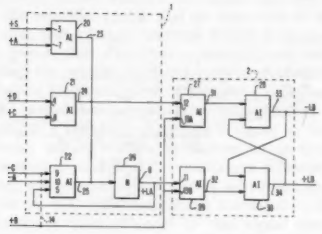
a fourth transistor having a base coupled to the collector of said third transistor and an emitter coupled to ground for

reinverting said data at its collector to form said first non-inverted output;
first feedback means coupled between the collector and base of said second transistor for latching the base voltage of said second transistor;
second feedback means coupled between the base and collector of said fourth transistor for latching the voltage at the base of said fourth transistor;
reset means coupled to said first feedback means and to said first transistor for forcing said first non-inverted output to a logical 0 and forcing the base of said second transistor to a logical 0; and
set means coupled to said second transistor and to said fourth transistor for forcing the base of said fourth transistor to a logical 0.

4,277,699
LATCH CIRCUIT OPERABLE AS A D-TYPE EDGE TRIGGER

David J. Brown, North Baddesley, England; Ronald G. Walther, Raleigh, N.C.; Thomas W. Williams, Longmont, Colo., and Michael D. Wrigglesworth, Pembroke Park, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 26, 1979, Ser. No. 60,933
Claims priority, application United Kingdom, Oct. 2, 1978, 39000/78
Int. Cl.³ H03K *3/037*
U.S. Cl. 307—272 R **4 Claims**

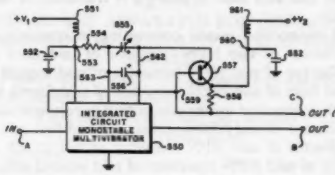


1. A shift register latch circuit for use in an integrated circuit conforming to Level Sensitive Scan Design (LSSD), said shift register latch circuit comprising:
a first AND/INVERT circuit having a first input for receiving a SCAN IN input, a second input for receiving a first clock pulse train, and an output;
a second AND/INVERT circuit having a first input for receiving a data input, a second input for receiving a second clock pulse train, and an output;
a third AND/INVERT circuit having a first input for receiving the complement of said second clock pulse train, a second input for receiving the complement of said first clock pulse train, a third input, and an output;
an Inverter circuit having an input and output;
a fourth AND/INVERT circuit having a first input connected in common to said output of said first AND/INVERT circuit, said output of said second AND/INVERT circuit, said output of said third AND/INVERT circuit and said input of said Inverter circuit, a second input, and an output;
a fifth AND/INVERT circuit having a first input connected in common to said output of said Inverter circuit and said third input of said third AND/INVERT circuit, a second input connected in common with said second input of said fourth AND INVERT circuit for receiving a third clock pulse train, and an output;
a sixth AND/INVERT circuit having a first input connected to said output of said fourth AND/INVERT circuit, a second input, and an output; and
a seventh AND/INVERT circuit having a first input connected to said output of said sixth AND/INVERT circuit, a second input connected to said output of said fifth AND-/INVERT circuit and an output connected to said second input of said sixth AND/INVERT.

4,277,700
OUTPUT ONE-SHOT

George J. Dusheck, Jr., Cinnaminson, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 3, 1969, Ser. No. 788,811
Int. Cl.³ H03K *3/033, 3/284*
U.S. Cl. 307—273 **7 Claims**



1. A logic circuit providing a digital output signal for selectable time periods comprising:
monostable multivibrator means for receiving a digital input signal and for providing an output pulse in response to said received digital signal;
first means operatively connected to said multivibrator means for controlling the duration of said pulse;
second means operatively connected to said first means and multivibrator means for providing changes in impedance in response to received signals;
a first positive voltage source;
a second positive voltage source;
a first decoupling network operatively connected to said first voltage source and said first means; and
a second decoupling network operatively connected to said second voltage source and said second means.

4,277,701
SEMICONDUCTOR INTEGRATED INJECTION LOGIC STRUCTURE CONTROLLED BY THE INJECTOR

Robert M. Hornung, Ris-Orangis, and Gerard M. Lebesnerais, St Fargeau-Ponthierry, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1978, Ser. No. 924,126
Claims priority, application France, Sep. 28, 1977, 77 29867
Int. Cl.³ H03K *19/091;* **H01L** *27/04;* **G11C** *11/40*
U.S. Cl. 307—291 **1 Claim**

1. A monolithic semiconductor bistable device having first and second stable states of conductivity, said bistable device comprising:
a first integrated injection logic unit including a lateral PNP transistor and a vertical NPN transistor having an emitter, base and first and second collectors;
a second integrated injection logic unit including a lateral PNP transistor and a vertical NPN transistor having an emitter, base and a single collector;
a third integrated injection logic unit including a lateral PNP transistor and a vertical NPN transistor having an emitter, base and first and second collectors;
a fourth integrated injection logic unit including a lateral PNP transistor and a vertical NPN transistor having an emitter, base and first, second and third collectors;
a fifth integrated injection logic unit including a lateral PNP transistor and a vertical NPN transistor having an emitter, base and first and second collectors;
a sixth integrated injection logic unit including a lateral PNP

transistor and a vertical NPN transistor having an emitter, base and first and second collectors;

a seventh integrated injection logic unit including a lateral PNP transistor and a vertical NPN transistor having an emitter, base and first and second collectors;

an eighth integrated injection logic unit including a lateral PNP transistor and a vertical NPN transistor having an emitter, base and first and second collectors;

First connection means connecting in common said emitters of said NPN transistors of said first through eighth units and a source of reference potential;

second connection means connecting in common said first collector of said NPN transistor of said first unit, said second collector of said NPN transistor of said fourth unit, said first collector of said NPN transistor of said seventh unit and said base of said NPN transistor of said eighth unit;

third connection means connecting in common said first collector of said NPN transistor of said third unit, said collector of said NPN transistor of said second unit, and said base of said NPN transistor of said fourth unit;

fourth connection means connecting in common said second collector of said NPN transistor of said first unit, said first collector of said NPN transistor of said fourth unit, said base of said NPN transistor of said second unit, and said second collector of said NPN transistor of said fifth unit;

fifth connection means connecting in common said second collector of said NPN transistor of said third unit, said third collector of said NPN transistor of said fourth unit, said base of said NPN transistor of said sixth unit, and said first collector of said NPN transistor of said fifth unit;

sixth connection means connecting in common said second collector of said NPN transistor of said eighth unit, said base of said NPN transistor of said seventh unit and said first collector of said NPN transistor of said sixth unit;

seventh connection means connecting in common said second collector of said NPN transistor of said sixth unit and said base of said NPN transistor of said fifth unit;

first and second complementary output terminals (Q,Q), said first output terminal (Q) being connected to said second collector of said NPN transistor of said eighth unit, said second output terminal (Q) being connected to said second collector of said NPN transistor of said seventh unit;

a preset control input (PS) terminal connected to the base of said NPN transistor of said first unit;

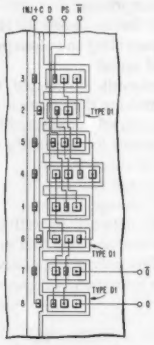
a clock input (H) terminal connected to the base of said NPN transistor of said third unit;

a data input (D) terminal connected to the base of said NPN transistor of said fifth unit;

an injector and clearing input (INJ+C) terminal connected in common to the emitter of each of said lateral PNP transistors of said first through eighth Integrated Injection Logic units;

said bistable device being further characterized in that the base width of each of the PNP transistors of said second, sixth and eighth units are respectively equal one to another, that the base width of each of the PNP transistors of said first, third, fourth, fifth and seventh units are respectively equal one to another, and that the base width of each of the PNP transistors of said second, sixth and eighth units is less than the base width of each of the PNP transistors of said first, third, fourth, fifth and seventh units; and

said bistable device being still further characterized in that a positive pulse, applied to said preset control input terminal causes said monolithic semiconductor bistable device to assume said first stable state (Q=1) and a negative pulse applied to the injector and clearing input terminal causes said monolithic semiconductor bistable device to assume said second stable state (Q=0).



4,277,702

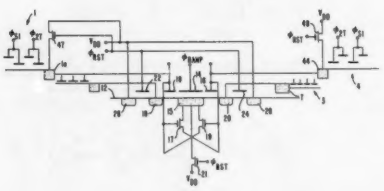
CHARGE COMPARATOR OUTPUT DRIVER

James M. Hamilton, Hawthorne, Calif., and Arthur J. Porter, Eugene, Oreg., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 21, 1979, Ser. No. 106,222

Int. Cl.[3] **H03K** *3/353;* **G11C** *19/28;* **H03K** *5/153;* **H01L** *29/78*

U.S. Cl. 307—304 **6 Claims**



1. A charge transfer device comparator refresher formed on the surface of a semiconductor substrate having a surface potential, comprising:

an input source of charge packets to be refreshed;

an output charge flow channel;

a first voltage source;

means for storing charge in a first portion of said surface in an amount proportional to the voltage of said first voltage source;

means for forming a signal potential barrier having a height proportional to the size of charge packets to be refreshed from said input source;

means for forming a reference potential barrier of a selected reference barrier height in said substrate surface potential;

means for changing the voltage of said first voltage source to eject the charge stored by said charge storing means and overflow one of said signal and reference potential barriers whenever one of said signal and reference potential barrier heights is less than the other, respectively;

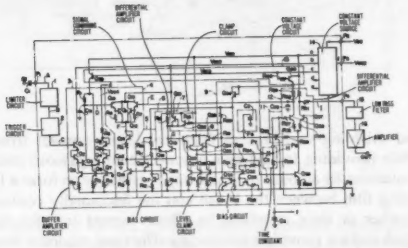
means for injecting charge into said output charge flow channel in response to charge overflowing one of said signal and reference barriers; and

latching means for setting one of said signal and reference barrier heights to be less than the other, said latching means having a feedback node isolated from said charge injecting means.

4,277,703
MONOSTABLE MULTIVIBRATOR CIRCUIT WITH CLAMPED NON-SATURATING COMMON EMITTER AMPLIFIER IN FEEDBACK PATH

Takeshi Wada; Masanori Ienaka, both of Kodaira; Yukihiko Miyamoto, and Tsuneo Yamada, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and Trio Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 9, 1979, Ser. No. 2,108
Claims priority, application Japan, Mar. 15, 1978, 53-28661
Int. Cl.³ H03K *5/08, 3/033*
U.S. Cl. 307—553 **3 Claims**

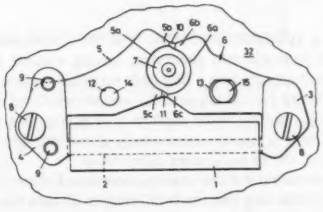


1. A monostable multivibrator circuit including a time constant circuit which includes a capacitor, an amplifier circuit which receives an output signal of the time constant circuit, a positive feedback circuit which is connected between an output end of the amplifier circuit and an input end of the time constant circuit, and a trigger terminal which is disposed in a circuit loop constructed of the time constant circuit, the amplifier circuit and the positive feedback circuit, characterized in that said positive feedback circuit comprises a signal amplifying transistor which has a base receiving an output of said amplifier circuit, a collector supplying a signal to said time constant circuit and an emitter connected to an emitter of another transistor in common, to constitute a differential amplifier circuit, and a level clamp circuit which is coupled to said collector of said signal amplifying transistor in order to hold a collector output potential of said signal amplifying transistor higher than a base input potential thereof.

4,277,704
MOTOR FOR ELECTRONIC WATCH

Urs Giger, Solothurn, and Norberto Perucchi, St. Blaise, both of Switzerland, assignors to Eta A.G. Ebauches-Fabrik, Grenchen, Switzerland

Filed Dec. 4, 1978, Ser. No. 966,219
Claims priority, application Switzerland, Dec. 13, 1977, 15316/77
Int. Cl.³ H02K *37/00*
U.S. Cl. 310—49 R **8 Claims**

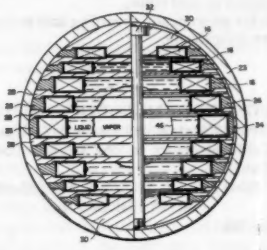


1. A stepping motor for electronic watches comprising an elongated stator plate having two ends and a central opening, the latter having a closed edge, a supporting plate on which said stator plate is secured, an elongated core magnetically connected to both ends of said stator plate, a coil wound onto said core, and a rotor lodged in said opening, wherein said stator plate comprises two pole portions and two joining elements, each one of said pole portions comprises two nose portions and a concave edge portion each of which joins two corresponding ones of said nose portions and forms a portion of said closed edge of said opening, wherein said joining elements are integral with said stator plate and have the same thickness as said pole portions, each one of said joining elements extends between two nose portions not belonging to the same pole portion, and said pole portions are of a material having a high magnetic permeability whereas said joining elements are of a material having a low magnetic permeability.

4,277,705
METHOD AND APPARATUS FOR COOLING A WINDING IN THE ROTOR OF AN ELECTRICAL MACHINE

Pedro A. Rios, Schenectady, N.Y., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Sep. 2, 1977, Ser. No. 830,131
Int. Cl.³ H02K *3/24*
U.S. Cl. 310—64 **9 Claims**



1. Apparatus for cooling a winding in a rotor of an electrical machine, comprising:

(a) a winding for carrying current in a rotor of an electrical machine, said winding cooled by a flow of liquefied gas through the rotor;

(b) a heat conductive mesh surrounding the winding and in thermal contact therewith for transferring heat developed in the winding to the liquefied gas, said mesh being perforated by a plurality of holes; and woven from both heat conductive filaments and electrically non-conductive filaments, the heat conductive filaments are woven into the mesh in a predetermined alignment so that heat developed in the winding is directed inward substantially toward the principal axis of the rotor and the electrically non-conductive filaments are woven into the mesh in a second predetermined alignment so that circulating currents are prevented from being conducted by the mesh in a direction parallel with the principal axis of the rotor; and

(c) an adhesive material serving to attach the mesh to the winding, said adhesive penetrates through the holes in the mesh to the surface of the winding.

4,277,706
ACTUATOR FOR HEART PUMP

Milton S. Isaacson, Dayton, Ohio, assignor to Nu-Tech Industries, Inc., Dayton, Ohio

Filed Apr. 16, 1979, Ser. No. 30,280
Int. Cl.³ H02K *7/06*
U.S. Cl. 310—80 **5 Claims**

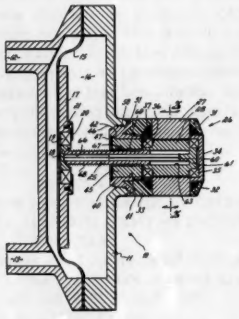
1. In a heart pump having a housing, inlet and outlet passageways in said housing, a diaphragm means for reciprocating said diaphragm comprising:

a brushless dc motor mounted on said housing, said motor

including a fixed stator and a rotor rotatably mounted in said stator,

a ball screw nut fixed to said stator,

a ball screw engageable with said diaphragm and threadedly connected by anti-friction balls to said nut,



said screw being axially slidable and fixed against rotation with respect to said rotor,

and means for periodically reversing said motor to cause said screw to reciprocate.

4,277,707

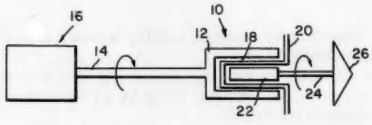
HIGH SPEED MAGNETIC COUPLING

Alexander Silver, Tarzana, and Kenneth L. Wuertz, Torrance, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 24, 1978, Ser. No. 899,669

Int. Cl.³ H02K *5/10*

U.S. Cl. 310—104 **32 Claims**



1. A magnetic coupling for coupling rotational motion through a sealed wall comprising rotatable driving means on one side of the sealed wall; first magnetic means having a longitudinal axis parallel with the axis of said driving means; first means for mounting said first magnetic means on said driving means and for maintaining the same under centrifugal compression along the entire axial length thereof upon rotation of said driving means; rotatable driven means axially aligned with said driving means on the opposite side of the sealed wall; second magnetic means having a longitudinal axis parallel with the axis of said driven means; and second means for mounting said second magnetic means on said driven means in magnetic coupling relation with said first magnetic means, and for maintaining said second magnetic means under centrifugal compression along the entire axial length thereof upon rotation of said driven means.

4,277,708

ENVIRONMENT AND BRUSHES FOR HIGH-CURRENT ROTATING ELECTRICAL MACHINERY

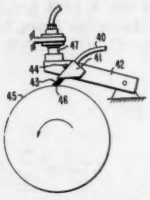
Ian R. McNab, Murrysville, and Philip Reichner, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 25, 1979, Ser. No. 51,927

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—228 **9 Claims**

1. A high-current electrical machine, comprising a stationary and a moving member and at least one fibrous current collector brush disposed between the members and in frictional contact with one member, the improvement comprising a current collector brush comprising a plurality of flexurally independent, electrically conducting, solid metal fibers where the mechanical fiber load of the brush at the area of frictional contact is between 1×10^{-6} lb./fiber and 1×10^{-2} lb./fiber,



and shielding said area of frictional brush contact from air while providing to said area a non-oxidizing gaseous medium containing an amount of water vapor effective to form a lubricating film between the brush and the frictionally contacting member at their interface, to allow current transfer to the brush and yet provide a lubricating effect and minimize wear at the area of brush friction.

4,277,709

LARGE DIAMETER SYNCHRONOUS ELECTRIC MACHINE

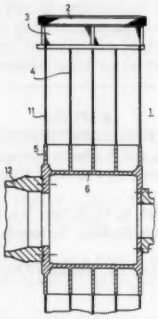
Franz Spirk, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 6, 1979, Ser. No. 55,462

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2831123

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—261 **3 Claims**



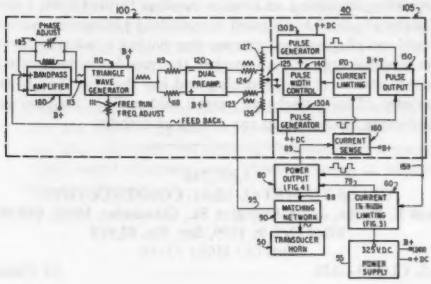
1. In a synchronous electric machine, especially a large diameter hydroelectric generator, having a rotor which has field poles supported on a ring built up of lamination segments, the ring being guided tangentially and shrink-fitted onto a hub carried on a hollow rotor shaft in such a way that the ring is lifted off only at speeds substantially above the nominal speed of rotation, the improvement comprising:

the dimensions for the seating surfaces of the shrink fit between the ring and the hub being so chosen that lifting of the ring below the nominal speed of rotation is provided in a portion of the axial length of the ring adjacent to the end face of the hub on the turbine side of the rotor and that lifting of the axial portion of the ring on the side of the hub facing away from the turbine can occur only at speeds substantially above the nominal speed.

4,277,710
CONTROL CIRCUIT FOR PIEZOELECTRIC ULTRASONIC GENERATORS

Philip C. Harwood, Elgin, and George H. Johnson, Dundee, both of Ill., assignors to Dukane Corporation, St. Charles, Ill.

Filed Apr. 30, 1979, Ser. No. 34,294
Int. Cl.³ H01L 41/08
U.S. Cl. 310—316 25 Claims

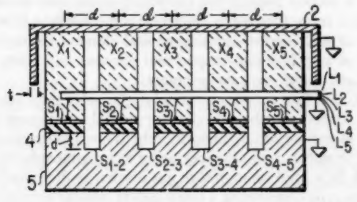


1. A generator for energizing an electro-acoustic transducer adapted to be coupled to a load for transferring acoustic energy thereto, said generator comprising a power output circuit coupled to the transducer and including switching means adapted to be connected to an associated source of direct current for producing an alternating current output, pulse generating means coupled to said switching means and providing thereto a series of pulses at an ultrasonic frequency, said switching means being responsive to each of said pulses for establishing a current flow to the transducer for a time period proportional to the duration of said pulse, and current control means coupled to said pulse generating means for varying the widths of said pulses thereby to vary the current flow to the transducer.

4,277,711
ACOUSTIC ELECTRIC TRANSDUCER WITH SHIELD OF CONTROLLED THICKNESS

Amin M. Hanafy, Andover, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 11, 1979, Ser. No. 83,692
Int. Cl.³ H01L 41/08
U.S. Cl. 310—334 1 Claim

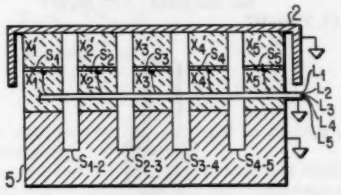


1. An acoustic electric transducer, comprising
a base,
a plurality of piezoelectric crystals mounted on said base in spaced parallel relationship with a given center-to-center spacing,
electrode means respectively in contact with each of said crystals so as to cause said crystals to have oscillatory changes in dimension at a frequency F_C in a direction perpendicular to the said base when driving voltage pulses are applied thereto, and
a metal shield mounted in electrical contact with the ends of said crystals that are opposite to said base, the thickness of said metal shield being such as to cause the asymmetric Lamb waves produced in said shield by said oscillatory changes in dimension of said crystals to have a wavelength in said shield that is twice the center-to-center spacing of said crystals.

4,277,712
ACOUSTIC ELECTRIC TRANSDUCER WITH SLOTTED BASE

Amin M. Hanafy, Andover, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 11, 1979, Ser. No. 83,693
Int. Cl.³ H01L 41/08
U.S. Cl. 310—334 4 Claims

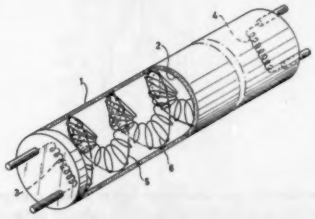


1. A transducer for translating electrical signals into acoustic signals and vice-versa, comprising
a base,
a plurality of rectilinear piezoelectric crystals mounted on said base in parallel, there being a space between each crystal and an adjacent one,
means for selectively applying electrical fields to said crystals so as to make them produce acoustic waves in a direction away from said base, and
means defining slots in the surface of said base on which the crystals are mounted, the said slots being respectively aligned with the spaces between said crystals so as to attenuate a Rayleigh wave emanating from each crystal along the surface of said base on which the crystals are mounted.

4,277,713
LOW-PRESSURE GAS DISCHARGE LAMP AND METHOD FOR MAKING

Jan Hasker; Johannes C. G. Vervest; Cornelis Peters, and Laurentius C. J. Vroomen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 27, 1979, Ser. No. 52,374
Claims priority, application Netherlands, Jul. 4, 1978, 7807218
Int. Cl.³ H01J 9/00, 61/04
U.S. Cl. 313—203 2 Claims



1. A low-pressure discharge lamp having an elongate discharge vessel which contains a thinly distributed filamentary body, permeable to the discharge, characterized in that said body comprises a helical support filament extending substan-

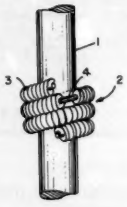
tially over the entire length of the discharge vessel at least partly adjacent the inner surface thereof and at least one further filament supported by the support filament and extending therefrom towards the axis of the discharge vessel, said one further filament being helically coiled around said support filament.

4,277,714

METAL HALIDE ARC DISCHARGE LAMP HAVING COILED COIL ELECTRODES

William M. Keeffe, Rockport; Frederic Koury, Bristol, and W. Calvin Gungle, Danvers, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 2, 1979, Ser. No. 54,106
Int. Cl.³ H01J *17/06, 61/073*
U.S. Cl. 313—217 **4 Claims**



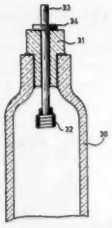
1. In a metal halide arc discharge lamp having a predetermined wattage and having an arc tube containing a fill including an inert gas and metal halide and having a main electrode at each end, the electrode comprising a coiled coil mounted on a rod, the coiled coil being made of a primary wire coiled on a mandrel wire and then coiled again, the improvement comprising the diameter of the rod in mils being equal to said wattage raised to the 0.56 power and then divided by 0.784, wherein the diameter of the primary wire in mils equals the rod diameter raised to the 1.8 power and then divided by 80.8.

4,277,715

ELECTRIC GAS DISCHARGE LAMP

Jacobus M. M. Claassens; Bart van der Leeuw, and Nicolaas F. van Elderen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 846,220, Oct. 27, 1977, abandoned.
This application May 7, 1979, Ser. No. 36,618
Claims priority, application Netherlands, Nov. 2, 1976, 7612120
Int. Cl.³ H01J *61/30, 61/36*
U.S. Cl. 313—220 **3 Claims**



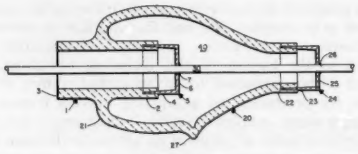
1. An electric gas discharge lamp which comprises: means for suspending a discharge vessel, a tubular ceramic discharge vessel including at least an end face having a generally axially aligned hole therein and a ceramic end plug which has a first portion having a circumferential surface having a gas tight seal with said hole and which extends axially within said one end face of said discharge vessel, said first portion cooperating directly or indirectly with said means for suspending, said lamp further including at least two electrodes and an ionizable medium in said discharge vessel, said end plug further including adjacent to said first portion an axially adjacent second portion extending away from said discharge vessel, said second portion having an outside diameter greater than said first portion, said second portion contacting said end face, said second portion of said end plug having an outside diameter not greater than 90% of the outside diameter of the discharge vessel, said means for suspending including an arcuate member formed from a strip of material which is disposed surrounding said second portion of said end plug, said arcuate member having a radius of curvature which is greater than one-half the outside diameter of said second portion of said end plug and less than one-half of the diameter of said discharge vessel, said arcuate member not conducting electricity to any of said electrodes.

4,277,716

GLASS-TO-METAL SEAL CONSTRUCTION

Neill K. Banks, Jr., 6 Arlington St., Gloucester, Mass. 01930

Filed Oct. 9, 1979, Ser. No. 82,919
Int. Cl.³ H01J *17/16*
U.S. Cl. 313—220 **12 Claims**



1. A glass-to-metal seal construction comprising:
(a) a first tubular glass element having first and second ends, said first end having sealingly embedded therein the sidewall of a first cup-shaped refractory metal seal element and said second end defining a free end adapted for fusion sealing thereof to another tubular glass ware;
(b) a second tubular glass element having first and second ends, said first end having a bore of sufficient diameter to receive said first tubular glass element of (a) and being sealingly fused thereto intermediate the first and second ends thereof, said second tubular glass element extending rearwardly and beyond said first end of said first tubular glass element, said second end of said second tubular glass element having sealingly embedded therein the sidewall of a second cup-shaped refractory metal seal element;
(c) a refractory metal electrode rod extending from the base of said second cup-shaped seal element through the base of said first cup-shaped seal element and being sealingly affixed to each said element;
(d) said first and second tubular glass elements, said first and second cup-shaped refractory metal seal elements and said electrode rod defining therebetween a hermetically sealed chamber, said chamber being at subatmospheric pressure.

12. In a high temperature gas discharge illuminating device of the type comprising a fused quartz tubular envelope, refractory metal seals joined to said envelope and a refractory metal electrode rod sealingly affixed to each said refractory metal seal and extending into said envelope, the improvement which comprises each said refractory metal seal comprising the construction:
(a) a first tubular fused quartz element having first and second ends, said first end having sealingly embedded therein the sidewall of a first cup-shaped refractory metal seal element and said second end being sealingly fused to said fused quartz tubular envelope, thereby to establish hermetically sealed open communication with the interior thereof;
(b) a second tubular fused quartz element having first and second ends, said first end having a bore of sufficient

diameter to receive said first tubular fused quartz element of (a) and being sealingly fused thereto intermediate the first and second ends thereof, said second tubular fused quartz element extending rearwardly and beyond said first end of said first tubular fused quartz element, said second end of said second tubular fused quartz element having sealingly embedded therein the sidewall of a second cup-shaped refractory metal seal element;

(c) a refractory metal electrode rod extending from the base of said second cup-shaped refractory metal seal element, through the base of said first cup-shaped refractory metal seal element and into said envelope, said electrode rod being sealingly affixed to said bases;

(d) said first and second tubular fused quartz elements, said first and second cup-shaped refractory metal seal elements and said electrode rod defining therebetween a hermetically sealed chamber, said chamber being at subatmospheric pressure.

4,277,717

LOW-PRESSURE SODIUM VAPOR DISCHARGE LAMP

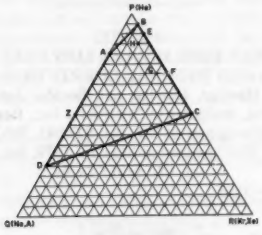
Willem Van Benthem, and Robertus L. C. De Vaan, both of, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 95,129

Claims priority, application Netherlands, Nov. 17, 1978, 7811350

Int. Cl.³ H01J *61/16, 61/22*

U.S. Cl. 313—226 **2 Claims**



1. A low-pressure sodium vapor discharge lamp comprising a discharge tube, at the ends of which electrodes are present said tube having a length of not more than 40 cm and a diameter of not more than 20 mm and an outer bulb enveloping this discharge tube, a mixture of rare gases being present in the discharge tube besides an excess of sodium, characterized in that the rare gas mixture comprises helium and at least one of the elements neon, argon, krypton and xenon, the composition of the rare gas mixture being represented by means of points located on or within the rectangle ABCD in the ternary volume composition diagram PQR, P representing helium, Q neon and/or argon and R representing krypton and/or xenon, A denoting a mixture consisting of 80% by volume of helium with 20% by volume of neon and/or argon, B denoting a mixture consisting of 95% by volume of helium with 5% by volume of krypton and/or xenon, C denoting a mixture consisting of 50% by volume of helium with 50% by volume of krypton and/or xenon and D denoting a mixture consisting of 25% by volume of helium with 75% by volume of neon and/or argon.

4,277,718

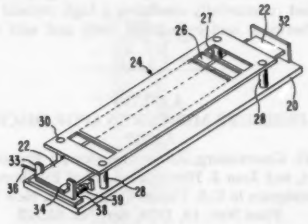
MODULAR ELECTRON TUBE WITH CARBON GRID

Merrald B. Shrader, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 7, 1979, Ser. No. 92,124

Int. Cl.³ H01J *1/46, 21/10*

U.S. Cl. 313—304 **12 Claims**



1. In an electron tube, an anode, and an electron source assembly comprising:

a common support member insulated from said anode,

a plurality of grid-cathode modules, each comprising at least one thermionic cathode having a substantially flat emissive surface, at least one grid formed of a substantially flat sheet of carbon with openings for passage of electrons, and mounting means for supporting said cathode and said grid in insulated spaced relationship to each other to form said module such that said sheet is positioned substantially parallel to said emissive surface, said mounting means of each module being independent of the mounting means of the other modules,

means for affixing said mounting means independently to said common support member such that said emissive surfaces face said anode, and said grids are between said emissive surfaces and said anode,

means for electrically connecting said cathodes to a common terminal, and

means for electrically connecting said grids to a common terminal.

4,277,719

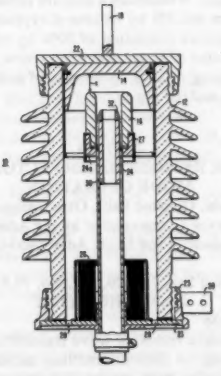
POWER SPARK GAP FOR HIGH CURRENT CONDUCTION

Oral L. Riggins, Odon, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1979, Ser. No. 59,403

Int. Cl.³ H01J *17/00, 21/00*

U.S. Cl. 313—325 **4 Claims**



1. A power spark gap for conduction of high currents upon

occurrence of an overvoltage comprising: a pair of electrodes, one of said pair of electrodes comprising a cylindrical body of electrode material spaced a first distance from the other of said pair of elelctrodes and an inner sleeve of more highly conductive material located within said cylindrical body and spaced farther than said first distance from said other electrode, said inner sleeve having the capability of conducting higher currents than said cylindrical body and serving as means for receiving and substantially confining a high current arc that is initiated between said cylindrical body and said other electrode.

4,277,720

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

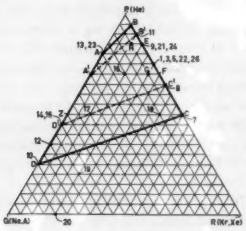
Winston D. Couwenberg; Albert Bouwknegt; Franciscus A. S. Ligthart, and Jean J. Heuvelmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 95,128

Claims priority, application Netherlands, Nov. 17, 1978, 7811351

Int. Cl.³ H01J *61/16*

U.S. Cl. 313—485 **3 Claims**



1. A low-pressure mercury vapor discharge lamp having a tubular discharge vessel which is closed in a vacuum-tight manner and having electrodes which are less than 40 cm apart, the inside diameter of this discharge vessel being less than 26 mm and a luminescent layer provided on the inner wall surface of the discharge vessel, the discharge vessel containing mercury and a mixture of rare gasses, characterized in that the rare gas mixture comprises helium and at least one of the elements neon, argon, krypton and xenon, the composition of the rare gas mixture being represented by means of points located at or within a quadrilateral ABCD in a ternary composition diagram PQR in which P represents helium, Q neon and/or argon, and R krypton and/or xenon, and wherein A indicates a mixture consisting of 80% by volume of helium and 20% by volume of neon and/or argon, B indicates a mixture consisting of 95% by volume of helium and 5% by volume of krypton and/or xenon, C indicates a mixture consisting of 50% by volume of helium and 50% by volume of krypton and/or xenon, and D indicates a mixture consisting of 25% by volume of helium and 75% by volume of neon and/or argon.

4,277,721

MULTISTAGE DEPRESSED COLLECTOR FOR DUAL MODE OPERATION

Henry G. Kosmahl, Olmsted Falls, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 7, 1979, Ser. No. 73,579

Int. Cl.³ H01J *23/02*

U.S. Cl. 315—5.38 **22 Claims**

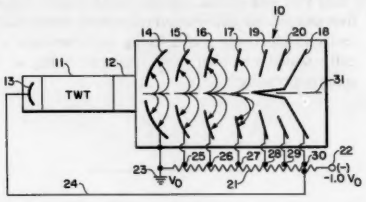
1. In a microwave traveling wave transmitting tube (TWT) of the type having an electron emitting cathode, a depressed collector and having high power and low power modes of operation, said TWT serving as a source providing a beam of spent electrons whose trajectories diverge from the beam axis in a downstream direction from said source;

a collector for said electrons, said collector comprising:

a first beam entrance electrode, said first electrode having a central aperture and being bowed toward said source of spent electrons;

a conical end electrode downstream from said first electrode having a spike extending from its apex toward said source of electrons, said spike lying on said beam axis;

at least one intermediate electrode positioned between said first electrode and said conical end electrode and having a central aperture, said aperture being of greater diameter



than the aperture of said first electrode, said intermediate electrode being bowed toward said source of spent electrons;

at least one low power mode electrode positioned between said intermediate electrode and said conical end electrode and having an aperture no larger than that of said intermediate electrode, and being axially positioned such that no more than about one-quarter of said spike extends through said aperture whereby most of said spent electrons pass between said spike and the edge of said aperture in said low power electrode when said tube is operated in said low power mode.

4,277,722

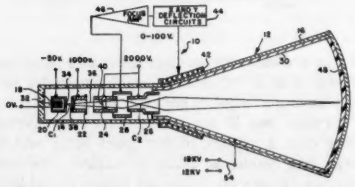
CATHODE RAY TUBE HAVING LOW VOLTAGE FOCUS AND DYNAMIC CORRECTION

Kenneth W. Hawken, Dundee, and Bozidar Janko, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 878,042, Feb. 15, 1978, abandoned. This application May 14, 1979, Ser. No. 38,606

Int. Cl.³ H01J *29/62*

U.S. Cl. 315—31 R **17 Claims**



1. An electron discharge device comprising:

beam-forming means including cathode means for emitting an electron beam, electrode means for forming said electron beam into a first crossover, first and second lens means along which said electron beam moves, said first lens means including focussing electrode means having a variable focussing voltage continuously applied thereto for dynamically controlling a second crossover of said electron beam relative to said second lens means for focussing said electron beam; and

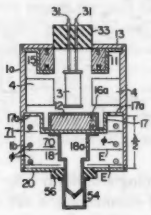
screen means onto which the electron beam is focussed from said second crossover by said second lens means.

4,277,723

SYMMETRICAL MAGNETRON WITH OUTPUT MEANS ON CENTER AXIS

Kazuo Kaneko, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1979, Ser. No. 15,131
Claims priority, application Japan, Feb. 24, 1978, 53/19793
Int. Cl.³ H01J 25/50
U.S. Cl. 315—39.77 8 Claims



1. A symmetrical magnetron comprising:
an anode cylinder provided with a plurality of vanes arrayed at the inner circumferential surface so as to form anode resonators positioned around a cathode;
a partition member having coupling openings formed therein and located in the vicinity of said vanes, each of said coupling openings being positioned in alignment with every other one of said vanes in said circumferential array;
a coaxial type cavity resonator provided in opposition to said vanes with said partition member being interposed therebetween and including a center conductor having a center axis substantially coinciding with the center axis of said anode cylinder, said coaxial type cavity resonator being adapted to be supplied with microwave energy through said coupling openings formed in said partition member;
means for radiating the microwave energy from the tip end of said center conductor of said coaxial type cavity resonator; and
means for insulating said radiating means from said cavity.

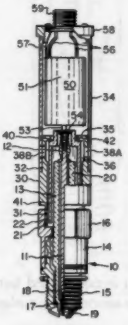
2. A symmetrical magnetron comprising:
an anode cylinder provided with a plurality of vanes arrayed at the inner circumferential surface so as to form anode resonators positioned around a cathode;
a partition plate having coupling openings formed therein and located in the vicinity of said array of vanes, each of said coupling openings being positioned in alignment with every other one of said vanes in said circumferential array;
permanent magnets positioned at a middle portion of said partition plate for producing a magnetic field running in a direction parallel to said vanes;
a coaxial type cavity resonator including an inner cylindrical conductor having one end connected to said partition plate at a middle portion thereof and extending in a direction opposite to said vanes, a portion of said anode cylinder extending in the direction opposite to said vanes from said partition plate and constituting an outer conductor and a conductor plate connected to the other end portion of said cylindrical conductor through an isolator and closing an end of said portion of said anode cylinder;
means for radiating microwave energy from the other end of said cylindrical conductor; and
means for insulating said radiating means from said cavity.

4,277,724

INTEGRAL SPARK PLUG COIL FOR AUTOMOTIVE-TYPE PLUG

Bruce R. Beeghly, Youngstown, Ohio, assignor to The Economy Engine Company, Youngstown, Ohio

Filed Oct. 18, 1979, Ser. No. 85,898
Int. Cl.³ H01J 7/44, 17/34, 19/78; H01K 1/62
U.S. Cl. 315—57 4 Claims



1. In an ignition device comprising a step-up coil unit to be associated with a spark plug, the improvement comprising said step-up coil unit comprising
an elongate tubular metal sleeve having means at one end for engaging the shell of the spark plug, said sleeve having at least one radial port through the side of the sleeve
an insulating bushing arranged substantially coaxial within the sleeve, and
a coil canister sealed to said sleeve having a coil therein,
the difference between the inner diameter of the metal sleeve and the outer diameter of the insulating bushing defining a narrow annular gap sized to quench a flame attempting to propagate therethrough,
whereby upon leakage of the seals in the spark plug the pressure does not build up in the coil canister but is released through the gap between the sleeve and the bushing and through the ports in the sleeve and whereby the condition of the spark plug can be checked by inserting a firing probe in the said at least one port.

4,277,725

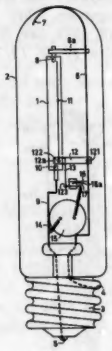
GAS AND/OR VAPOR DISCHARGE LAMP

Andreas P. E. Sneijers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1979, Ser. No. 69,441
Claims priority, application Netherlands, Sep. 5, 1978, 7809055
Int. Cl.³ H01J 7/44, 17/34, 19/78; H01K 1/62
U.S. Cl. 315—73 5 Claims

1. A gas and/or vapor discharge lamp having a discharge tube with at least first and second main electrodes and an external ignition auxiliary means, and a bimetallic switch having a least three connection contacts, the first main electrode being connected to the first connection contact and the external ignition auxiliary means being connected to the second connection contact, all the connection contacts of the bimetallic switch in the inoperative condition of the lamp being mutually connected electrically, the mutual electric contact be-

tween each of the connection contacts being interrupted in the operating condition of the lamp, and said lamp further includ-



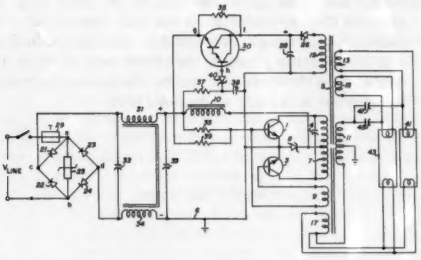
ing a glow starter which is connected between the third connection contract and the second main electrode.

4,277,726

SOLID-STATE BALLAST FOR RAPID-START TYPE FLUORESCENT LAMPS

Robert V. Burke, Ft. Wayne, Ind., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 28, 1978, Ser. No. 937,119
Int. Cl.³ H05B *39/00, 41/14*
U.S. Cl. 315—98 **21 Claims**



1. In an inverter-oscillator means for supplying AC voltage and current for starting and operating an electrical load of the type comprising a capacitor and a gaseous discharge lamp of the type requiring a high starting voltage and a lower operating voltage connected in electrical series circuit, whereby current through said circuit is dependent upon the AC voltage across said load and the frequency of said AC voltage, and inverter-oscillator means for generating high frequency AC voltage, including transistor means and transformer means, said transformer means responsive to current from said transistor means for producing an AC voltage proportional in level to said current and applying said voltage to said electrical load, and power supply means for supplying DC voltage and current to said inverter-oscillator means, the improvement comprising in combination therewith:

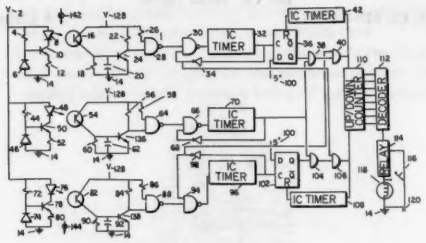
first means responsive to a change in level of said DC voltage for producing an inverse change in the frequency of oscillation of said inverter-oscillator means.

4,277,727

DIGITAL ROOM LIGHT CONTROLLER

Francis E. LeVert, 7233 S. Luella, Chicago, Ill. 60649

Filed Aug. 2, 1979, Ser. No. 63,359
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—155 **4 Claims**



1. Apparatus for turning a light on when a person enters an unoccupied room and maintaining a net count equal to the difference between the number of persons entering and leaving the room so as to automatically maintain the room light in an on position when the total count is greater than zero or to maintain the room light in an off position when the total count is zero comprising: three emitters of invisible light adapted to emit three beams of said light in a horizontal plane across a doorway; three beam sensors positioned in said doorway so as to sense an interruption of one or more said invisible light beams transmitted thereto;

electronic means cooperating with each one of said sensors for emitting a pulse of electric current for each interruption of each said invisible light beam;

electronic means for generating an electrical signal of finite duration in response to each said pulse of electric current;

electronic means for processing said signals so as to produce a first output pulse only when said signals are generated in a first predetermined sequence and for producing a second output pulse only when said signals are generated in a second predetermined sequence;

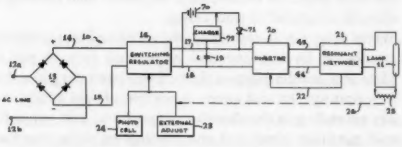
an up-down counter for counting said output pulses having the first output pulse applied to its UP input terminal and the second output pulse applied to its DOWN input terminal; and, electronic means for decoding the accumulated count stored in said counter and controlling the on/off state of the room lights in accordance therewith.

4,277,728

POWER SUPPLY FOR A HIGH INTENSITY DISCHARGE OR FLUORESCENT LAMP

Carlile R. Stevens, Danville, Calif., assignor to Stevens Luminoptics, San Ramon, Calif.

Filed May 8, 1978, Ser. No. 903,583
Int. Cl.³ G05F *1/00*; H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—307 **33 Claims**



1. A power supply for a gas discharge lamp comprising:

a source of DC voltage;

an inverter connected to receive DC voltage from said source comprising a pair of switching transistors for alternately switching DC voltage from said source;

a resonant network whereby the output of the inverter as presented to the lamp will be sinusoidal in wave shape;

said inverter includes a transformer, the output of said transformer being connected to said resonant network which is in turn connected to the lamp;

an oscillator connected to control the switching rate of said pair of switching transitors to switch said transistors at such time as the current flowing in or out of said resonant circuit shall be at or near zero;

a feed-back means which determines that said resonant network is at resonance and that it presents a resistive load to said inverter;

a frequency control means for said oscillator connected to the feedback means in such a manner as to control the frequency to maintain resonance in said resonant network.

4,277,729

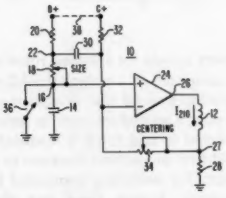
SIMPLIFIED VERTICAL DEFLECTION CIRCUIT

Robert L. Rodgers, III, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 94,287

Int. Cl.³ H01J *29/54*

U.S. Cl. 315—398 **3 Claims**



1. An improved sawtooth generating circuit for driving a deflection winding, comprising:

a first capacitor having a first electrode coupled to a first point of reference potential and having a second electrode;

first and second resistance means serially coupled between a second point of reference potential and said second electrode for providing current for charging said first capacitor to form a voltage ramp;

a voltage amplifier including an inverting input terminal and also including a noninverting input terminal coupled to said second electrode for generating and applying an output signal to the deflection winding;

current sensing resistance means serially coupled with said winding for producing a feedback voltage signal representing the current through said deflection winding in response to said output signal;

coupling means coupling said current sensing resistance means with said inverting input terminal for closing a feedback loop about said amplifier for causing said current produced in response to said output signal to track said voltage ramp;

second capacitance means coupled to said inverting input terminal and to the juncture of said first and second resistance means for coupling said feedback voltage signal to said juncture for maintaining a relatively constant voltage across said second resistance means for maintaining a relatively constant current therethrough for linearizing said voltage ramp;

third resistance means coupled between a point of reference potential and said inverting input terminal;

wherein the improvement lies in that said coupling means comprises variable resistance means for forming with said third resistance means a voltage divider for controlling the magnitude of said deflection current during those intervals in which said first capacitor is discharged for providing centering control of the raster.

4,277,730

VOLTAGE LIMITER FOR FLYBACK GENERATOR OF TELEVISION SWEEP SYSTEM

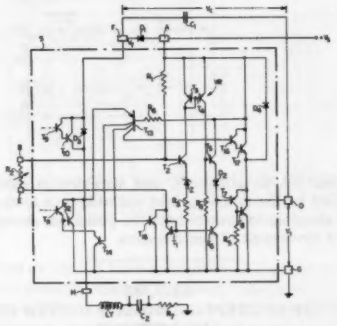
Antonio Colombo, Tradate, Italy, assignor to SGS-ATES Componenti Elettronici S.p.A, Agrate Brianza, Italy

Filed Jul. 25, 1979, Ser. No. 60,344

Claims priority, application Italy, Jul. 26, 1978, 26119 A/78

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—408 **5 Claims**



1. In a sweep system controlling the energization of a deflection coil of a cathode-ray tube during alternate scanning and flyback periods, including a storage capacitor, a charging transistor inserted between one side of said storage capacitor and a low-voltage terminal of a direct-current source, an isolating diode inserted between the other side of said storage capacitor and a high-voltage terminal of said source carrying a supply voltage V_s, said diode enabling said storage capacitor to charge to a voltage $V_c = V_s - V_l$ where V_l is a voltage drop across said charging transistor, periodically operating switch-over means for cutting off said charging transistor during each flyback period and simultaneously connecting said one side of said storage capacitor to said high-voltage terminal whereby said other side is carried to a potential $V_f = V_s + V_c$, and circuit means connecting said other side of said storage capacitor to said coil for applying said potential V_f thereto during each flyback period,

the combination therewith of voltage-regulating means connected across said source for controlling the construction of said charging transistor during said scanning periods in response to fluctuations of said supply voltage V_s to limit said potential V_f to a predetermined maximum, said voltage-regulating means comprising a current-amplifying network establishing a threshold voltage V_t and maintaining said charging transistor saturated during said scanning periods as long as $V_s \leqq V_t$, said network including impedance means dimensioned to make said voltage drop V_l substantially equal to $2(V_s - V_t)$ upon said supply voltage V_s exceeding said threshold voltage V_t, thereby preventing said potential V_f from exceeding a value of substantially 2 V_t.

4,277,731

WRAPPING MACHINE

Endre Pongracz, Ecublens, Switzerland, assignor to SAPAL Société Anonyme des Plieuses Automatiques, Switzerland

Filed Aug. 15, 1978, Ser. No. 933,913

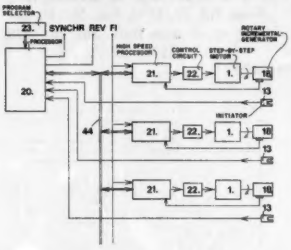
Claims priority, application Switzerland, Sep. 7, 1977, 10976/77

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—685 **12 Claims**

1. A wrapping machine comprising a plurality of movable elements and control means for controlling the positional movements and movement speed of said elements, wherein said control means comprise a first pulse generator for syn-

chronization, and a control circuit receiving pulses from said pulse generator, said control circuit including a computer, the store of which contains at least one working program, peripherals connected to the computer each comprising a processor



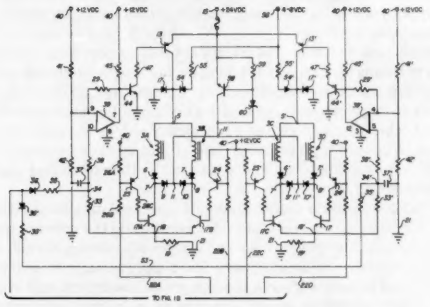
controlled by the computer, and step-by-step motor means controlled by the processor and operable to actuate each one of said elements to control both the positional movement and speed of movement of said elements.

4,277,732

LOW POWER STEPPING MOTOR DRIVER CIRCUIT AND METHOD

Lorenz A. Hittel, Paradise Valley, and Raymond H. Yurcik, Jr., Peoria, both of Ariz., assignors to Graphtek, Inc., Phoenix, Ariz.

Filed Aug. 3, 1979, Ser. No. 63,173
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **16 Claims**



1. A method of operating a stepping motor to advance the rotor of the stepping motor from a first step position to a second step position, said method comprising the steps of:

a. coupling a first terminal of a winding of the stepping motor to a first voltage supply conductor in response to a first control signal to cause a winding current to increase in the winding;

b. sensing said winding current by causing said winding current to flow through a resistor;

c. producing said first control signal and a second control signal in response to a voltage produced across said resistor by said winding current, said second control signal indicating when said winding current exceeds a first predetermined level, said first control signal indicating when said winding current is less than a second predetermined level;

d. uncoupling the first terminal from the first supply voltage conductor in response to said second control signal and maintaining the first terminal uncoupled from the first supply voltage conductor, causing said winding current to decrease until said winding current falls below said second predetermined level; and

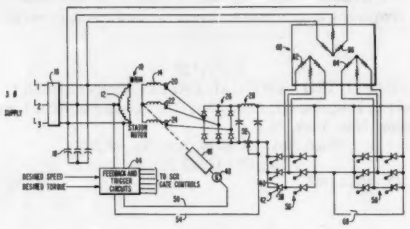
e. repeating steps (a) through (c) to produce a predetermined average current in the winding to effect moving of the rotor from said first step position toward said second step position.

4,277,733

SLIP RECOVERY SYSTEM FOR WOUND ROTOR MOTOR

William A. Munson, Amherst, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 5, 1979, Ser. No. 17,666
Int. Cl.³ H02P *7/36*
U.S. Cl. 318—732 **4 Claims**



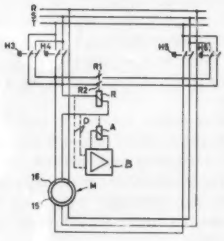
1. A slip recovery system for a wound rotor induction motor having a stator connected to a polyphase AC supply voltage, and a rotor coupled to a useful load comprising: a first inverter coupled to said rotor; a second inverter, in series with said first inverter, and coupled to said rotor; a feedback path coupling the outputs of said first and second inverters to said AC supply voltage; and means for switching connected in parallel with said second inverter, having open and closed positions, whereby said switching means is operated in the open position during starting and stopping said motor, and in said closed position during running operation.

4,277,734

ELECTRIC BRAKE MOTOR

Rudolf Uhrner, Kuenzelsau; Klaus Teuke, Doerzbach, and Wolfgang Schwarz, Uebrigshausen, all of Fed. Rep. of Germany, assignors to R. Stahl GmbH & Co., Fed. Rep. of Germany

Filed Apr. 30, 1979, Ser. No. 34,506
Claims priority, application Fed. Rep. of Germany, May 6, 1978, 2819942
Int. Cl.³ H02P *1/26, 3/18*
U.S. Cl. 318—758 **9 Claims**



1. An electric brake motor having a casing, said motor comprising

(a) a stator winding supported within the motor casing;

(b) a rotor mounted for rotation relative to said stator winding;

(c) means supplying driving current to said motor;

(d) normally-activated brake means connected with the

motor casing, said brake means being operable to a brake-released condition when the motor current reaches a given value; and

(e) means including electric switch means for briefly increasing said motor current to said given value during starting of the motor.

4,277,735

CONTROL APPARATUS FOR INDUCTION MOTOR

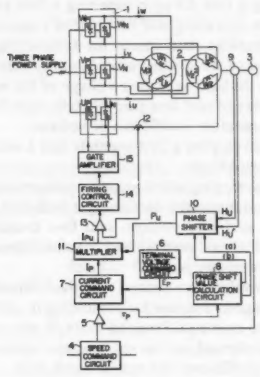
Toshiaki Okuyama; Yuzuru Kubota, and Hiroshi Nagase, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1979, Ser. No. 2,799

Claims priority, application Japan, Jan. 11, 1978, 53-112278

Int. Cl.³ H02P 7/36

U.S. Cl. 318—766 **5 Claims**



1. A control apparatus for an induction motor comprising:

(a) the induction motor having multi-phase primary and secondary windings connected in opposite phase relation,

(b) a position sensor for producing a position signal indicative of a rotor position of said induction motor,

(c) a common frequency converter for supplying a variable frequency A.C. current to the windings of said induction motor,

(d) a speed control circuit for producing a torque command signal indicative of an error between a speed command signal and a speed feedback signal,

(e) a current command circuit for producing a current command signal in accordance with magnitudes of said torque command signal and a voltage command signal for determining a terminal voltage of said induction motor,

(f) phase command means for determining a phase of a motor current relative to an air gap flux in accordance with said torque command signal and said voltage command signal, and

(g) frequency converter control means for controlling a phase of the output current of said frequency converter in accordance with the output of said phase command means and for controlling a magnitude of the output current of said frequency converter so as to be proportional to said current command signal.

4,277,736

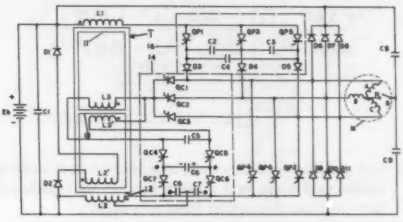
ENERGY CONTROLLER FOR CONVERSION FROM A DIRECT CURRENT SOURCE TO A VARIABLE FREQUENCY LOAD

Jay Boyce, Anaheim, Calif., assignor to Jay Boyce & Associates, Anaheim, Calif.

Filed Nov. 30, 1979, Ser. No. 98,980

Int. Cl.³ H02P 7/42, 7/64

U.S. Cl. 318—811 **10 Claims**



1. A turn off circuit for a multiphase motor, comprising:

i. a D.C. powered system, including a single, three element choke core having outer cores with loosely coupled outer windings to reduce rf transients, and a central core being closely coupled to each outer core to enhance pulse generation;

ii. a plurality of steering SCRs connected between the central core and an outer core for receiving pulse width modulation signals from a controller which provides the signals in response to motor load demand;

iii. one or more discharge capacitors for turning off the steering SCRs, the close coupling between the central and outer cores improving pulse generation characteristics of the discharge capacitors, inductance decay energy produced by the motor during free wheeling being fed to the steering SCRs and discharge capacitors to increase firing energy;

iv. an SCR ring counter for applying D.C. power to the motor to produce a three phase wave shape with less distortion and lower noise, pulse width modulation being supplied to the ring counter from the steering SCRs; and,

v. a plurality of regeneration diodes for recovery of excess energy from the discharge capacitors and return to the D.C. source.

4,277,737

METHOD OF AND MEANS FOR UTILIZING RECHARGEABLE BATTERIES IN THE OPERATION OF ELECTRIC VEHICLES

Bernd Müller-Werth, Hildegardstrasse 13, D-6670 St. Ingbert, Fed. Rep. of Germany

Filed Sep. 7, 1978, Ser. No. 940,162

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740438

Int. Cl.³ H02J 7/00; H01M 10/50; H02G 13/08

U.S. Cl. 320—2 **7 Claims**

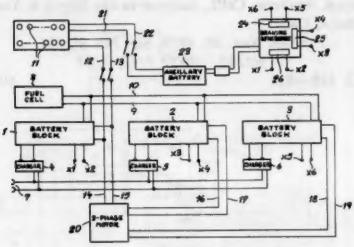
1. In an energizing circuit for an electric motor driving an automotive vehicle, in combination:

an assembly of rechargeable batteries;

an enclosure accommodating a block of said batteries and forming an injection channel above said block, said enclosure comprising a symthetic-resin-impregnated glass-fiber

mat, said channel being occupied by a mass of molded resin;

at least one cooling bar in said injection channel; and



a heat-generating component mounted on said cooling bar within said mass, said cooling bar having significant surface portions projecting from said mass.

4,277,738

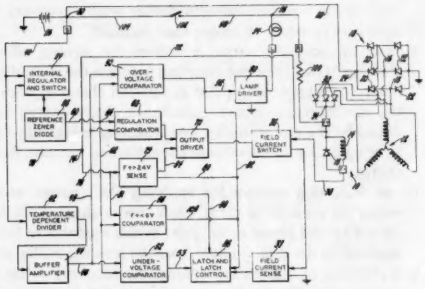
GENERATOR VOLTAGE REGULATOR

Richard J. Voss, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 18, 1979, Ser. No. 49,320

Int. Cl.³ H02J *7/24*

U.S. Cl. 322—28 **6 Claims**



1. A motor vehicle electrical system having a fault indicating capability comprising, an alternating current generator having a field winding and an output winding, rectifier means having AC input terminals connected to said output winding and direct voltage output terminals, a battery, means connecting said battery across said direct voltage output terminals, means connected to said direct voltage output terminals for providing a first voltage that varies with the voltage across said battery, means coupled to said direct voltage output terminals for providing a substantially constant reference voltage, voltage regulating means comprising field current switching means connected in series with said field winding for controlling field current, means responsive to said first voltage and said reference voltage for controlling the operation of said field current switching means to thereby regulate the output voltage of said rectifier means, under-voltage comparator means for comparing said first and reference voltages operative to provide a control signal when said first voltage drops to a value indicative of low battery voltage, field current sensing means connected to said field winding for sensing generator field current, a signal lamp, means responsive to said field current sensing means and to said control signal for causing said lamp to be energized to indicate a fault condition when said first voltage is below said value and said field current is below a predetermined value.

4,277,739

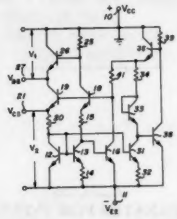
FIXED VOLTAGE REFERENCE CIRCUIT

Ury Priel, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 1, 1979, Ser. No. 44,833

Int. Cl.³ G05F *1/58*

U.S. Cl. 323—313 **8 Claims**



1. A circuit for developing a first output voltage referenced with respect to the positive terminal of a positive rail connectible to a power supply and a second output voltage referenced with respect to a negative rail connectible to the negative terminal of said power supply, said circuit comprising: means for developing a first ΔV_{BE} comprising a first pair of transistors, means for operating said first pair of transistors at different current densities, and means for subtracting the base to emitter voltage of the lower current density transistor of said first pair from the base to emitter voltage of the higher current density transistor of said first pair whereby said first ΔV_{BE} has a positive temperature coefficient of voltage;

means for developing a first multiple and a second multiple of said first ΔV_{BE};

means for developing a first negative temperature coefficient voltage and means for combining it with said first multiple to create said first voltage, said first multiple being selected so that said positive and negative temperature coefficients are nearly equal;

means for developing a second negative temperature coefficient voltage and means for combining it with said second multiple to create said second voltage, said second multiple being selected so that said positive and negative temperature coefficients are nearly equal; and

means for maintaining a constant current in said means for developing a first negative temperature coefficient voltage.

4,277,740

CABLE TESTER FOR MULTIPAIR CABLES

Kenneth B. Parks, Lilburn, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 22, 1979, Ser. No. 87,433

Int. Cl.³ G01R *31/02*

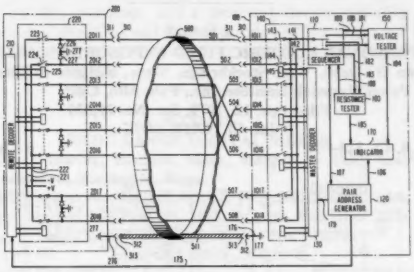
U.S. Cl. 324—51 **9 Claims**

9. A method for detecting transpositions of conductor pairs in a multiconductor cable

characterized by the steps of

synchronously removing a direct current voltage from said

one end of each of said pairs while connecting the other end of the same pair to a voltmeter, and



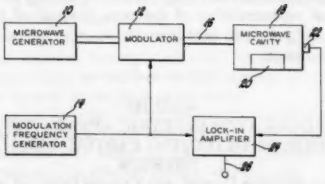
identifying transposed connected conductor pairs having a direct current voltage thereon.

4,277,741

MICROWAVE ACOUSTIC SPECTROMETER

Frederick R. Faxvog, Rochester, and Mark K. Krage, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 25, 1979, Ser. No. 51,623
Int. Cl.³ G01R *27/04*
U.S. Cl. 324—58.5 C **3 Claims**



1. A microwave-acoustic spectrometer for measuring a microwave absorption parameter of a non-gaseous sample material comprising,

a sealed microwave cavity containing the sample material and a gas,

a source of microwave radiation,

means for modulating the radiation at a reference frequency,

means for propagating the radiation into the microwave cavity to thereby allow microwave absorption by the sample material, whereby the sample material and the gas in the cavity is periodically heated to produce pressure fluctuations at the reference frequency,

a microphone coupled to the cavity and responsive to the pressure fluctuations therein to produce a signal at the reference frequency having a parameter correlated to the absorption parameter, and

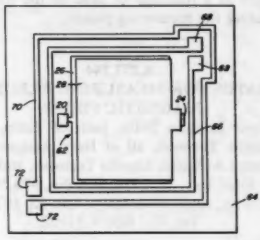
means for analyzing the microphone signal at the reference frequency to provide an output which is a measure of microwave absorption by the sample material.

4,277,742

ABSOLUTE HUMIDITY SENSORS AND METHODS OF MANUFACTURING HUMIDITY SENSORS

Michael G. Kovac, Sudbury; David J. Chleck, Brookline, and Philip Goodman, Lexington, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Division of Ser. No. 764,394, Jan. 31, 1977, Pat. No. 4,143,177.
This application Nov. 24, 1978, Ser. No. 963,429
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 R **16 Claims**



1. An absolute humidity sensor comprising

a substrate having a microscopically smooth surface,

a planar, porous, dielectric first layer of material having a first face bonded to said substrate surface and a second face, said faces separated by a distance of the order of 1000 A,

means establishing electrical contact with said first face, and

means establishing electrical contact with said second face comprising

a second layer of moisture permeable electrically conductive material bonded to said second face, and

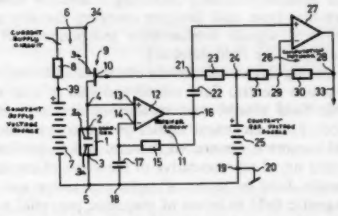
an electrically conductive strip in electrical contact with said second layer, and extending beyond the boundaries of said first layer, to a contact location formed on said substrate.

4,277,743

METHOD AND CIRCUIT FOR PRODUCING MEASURING PULSES IN A PARTICLE ANALYZER

Walter Guggenbühl, Stäfa, Switzerland, assignor to Contraves AG, Zürich, Switzerland

Filed Jul. 12, 1978, Ser. No. 923,915
Claims priority, application Switzerland, Aug. 25, 1977, 10390/77
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—71 CP **7 Claims**



1. In a method of producing measuring pulses in a particle analyzer for the analysis of particles suspended in a liquid, especially blood cells, employing a conductivity cell whose impedance between two terminals of the conductivity cell changes upon passage of a particle through the conductivity cell, a controlled-current source for supplying the conductivity cell with a current controlled by a control voltage, and a

receiver containing means structured as a high-pass filter and having high input impedance for the essentially currentless removal of a cell voltage between the terminals of the conductivity cell and for generating a received voltage which corresponds to such components of such cell voltage whose frequency is above a cut-off frequency of the high-pass filter, the improvement which comprises the steps of:

generating the control voltage from the sum of a predetermined reference voltage and the received voltage;

generating a measuring signal proportional to the difference of the control voltage and the reference voltage; and

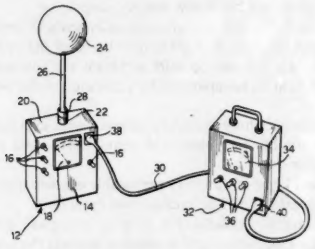
the changes as a function of time of the measuring signal constituting the measuring pulses.

4,277,744

APPARATUS FOR MEASURING ELECTRIC AND MAGNETIC FIELDS

Bruno Audone; Luciano Bolla, both of Turin, and Giuseppe Gerbi, Caselle Torinese, all of Italy, assignors to Aeritalia S.p.A. Settore Avionica, Caselle Torinese, Italy

Filed Dec. 26, 1978, Ser. No. 973,283
Claims priority, application Italy, Apr. 13, 1978, 67824 A/78
Int. Cl.³ G01N *31/02*
U.S. Cl. 324—72 **20 Claims**



1. Apparatus for the measurement of radio frequency electromagnetic radiation, including:

at least one isotropic, balanced electric field sensor sensitive to the electric field component of incident electromagnetic radiation and responsive thereto to generate an electrical signal dependent on the intensity of the electric field detected;

at least one isotropic, balanced magnetic field sensor sensitive to the magnetic field component of incident electromagnetic radiation and responsive thereto to generate an electrical signal dependent on the intensity of the magnetic field detected:

each of said at least one electric field sensor and magnetic field sensor having detector circuitry connected thereto, said detector circuitry including a detector diode of the zero bias type, said detector circuitry thereby providing electrical signals substantially independent of the frequency of the field detected;

a measuring device selectively connectable to one of said at least one electric field sensor and said at least one magnetic field sensor, said measuring device operating to process said electrical signals generated by whichever of said sensors is connected thereto, and to produce a processed signal representative of the value of one of the real electric field in terms of volts per meter and the real magnetic field in terms of magnetic potential per meter, depending on which of said sensors is connected thereto,

indicator means of said measuring device operating to indicate the value of said processed signal, which represents the value of whichever of the real electric field in terms of volts per meter and the real magnetic field in terms of magnetic potential per meter to which said one of said sensors connected to said measuring device is sensitive, and

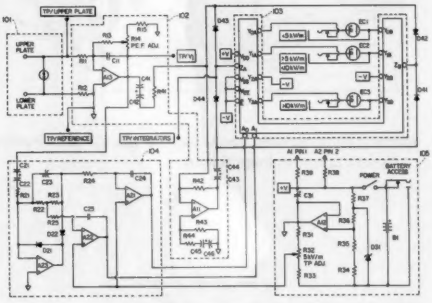
a repeater device selectively connectable to said measuring device and operating when so connected to provide a duplicate indication of the indication provided by said measuring device.

4,277,745

PERSONAL ELECTRIC FIELD EXPOSURE MONITOR

Don W. Deno, West Stockbridge, Mass., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 12, 1979, Ser. No. 29,330
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—72 **6 Claims**



1. A system for monitoring low frequency electric fields comprising:

a sensor for sensing an electric field at a selected location and generating an electrical signal indicative of the strength of the electric field;

a switching means to receive said electrical signal and to switch, as a function of the electric field intensity, said electrical signal to one of a plurality of output terminals, and

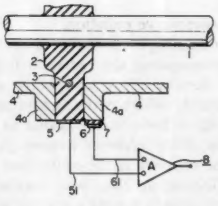
a plurality of integrating means, one each of said plurality of integrating means connected to receive the switched electrical signal from a corresponding one of said plurality of output terminals and each capable of storing an electrical signal representative of the time integral of the corresponding electric field intensity so as to measure electric field dosage.

4,277,746

GAS-INSULATED ELECTRIC APPARATUS AND METHOD OF DETECTING PARTIAL DISCHARGE THEREIN

Kozin Abe; Norihira Uozumi, and Kazuaki Oishi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1979, Ser. No. 8,840
Claims priority, application Japan, Feb. 3, 1978, 53-10493
Int. Cl.³ G01R *31/00;* H02G *5/06;* H01B *9/06*
U.S. Cl. 324—72 **14 Claims**



1. In a gas-insulated electric apparatus comprising an insulating-gas-filled metallic container within which a conductor carrying a high voltage current is supported by an insulating supporter, the improvement which comprises a first electrode

disposed opposite to said conductor so as to form a first electrostatic capacity therebetween through at least a portion of said insulating supporter, a capacitor having a second electrostatic capacity and having one end connected to the outside of said metallic container, and a detecting device including a differential amplifier, said first electrode and the other end of said capacitor being connected to respective inputs of said differential amplifier.

4,277,747

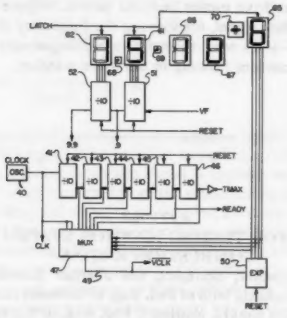
WIDE RANGE DIGITAL METER

Philip C. Harvey, Bedford, Mass., assignor to MKS Instruments, Inc., Burlington, Mass.

Division of Ser. No. 794,218, May 5, 1977, which is a division of Ser. No. 645,789, Dec. 31, 1975, Pat. No. 4,035,720. This application Dec. 26, 1978, Ser. No. 972,948

Int. Cl.³ G01R *23/02*

U.S. Cl. 324—78 D **1 Claim**



1. A wide range digital event per unit time meter comprising:

a timing counter having a plurality of stages, successive ones of which are driven by the respective preceeding stages, each stage corresponding to a respective possible timing interval differing from the intervals of the adjacent stages by a predetermined factor;

a clock pulse source for driving said timing counter;

an event counter having a plurality of stages essentially corresponding in number to the number of significant digits desired in the final event count;

gating means for selectively initiating the event counting by said event counter after resetting of said event and timing counters and for stopping the event counting upon the completion of a selected timing interval; and

switching means, controlled by the timing counter and the event counter and operative at a predetermined point prior to the completion of each possible timing interval, for selecting the next longer timing interval if the event count has not reached a preselected level, the state of the switching means when the event count is completed being then indicative of the exponent of the radix by which the final event count should be multiplied.

4,277,748

ANGLE DIGITIZER

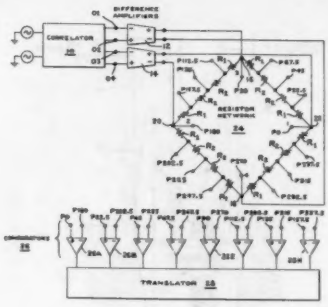
Carl W. Gerst, Skaneateles, and Leonard J. Paciorek, North Syracuse, both of N.Y., assignors to Anaren Microwave, Incorporated, Syracuse, N.Y.

Filed Aug. 29, 1979, Ser. No. 70,687

Int. Cl.³ G01R *25/00*

U.S. Cl. 324—83 D **7 Claims**

1. Apparatus for converting a signal representing sin θ and a signal representing cos θ to a digital value representing the angle θ comprising: first and second input terminals across which is applied a signal proportional to sin θ; third and fourth input terminals across which is applied a signal proportional to cos θ; four sets of the same number of impedors, a first of said sets being connected between said first and third input terminals, a second of said sets being connected between said third and second input terminals, a third of said sets being connected between said second and fourth input terminals, a fourth of said sets being connected between said fourth and first input terminals; a plurality of output terminals, each of said output terminals being connected to the junction of each pair of adjacent impedors; and a plurality of two-input logic means for giving a first level signal at an output when the signal at one input is greater than the signal at the other input and for giving a second level signal at said output when the signal at said one input is less than the signal at said other input, the two inputs of each logic means being connected to a pair of said output terminals which have an antiphase relationship.



4,277,749

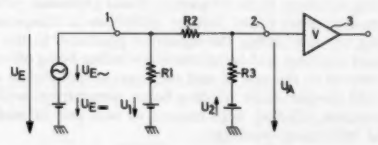
INPUT CIRCUIT FOR ELECTRONIC INSTRUMENTS

Stefan Traub, Böblingen, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 21, 1979, Ser. No. 13,713

Int. Cl.³ G01R *15/00*

U.S. Cl. 324—126 **6 Claims**



1. An electrical circuit to compensate for the DC component of an input signal referenced to a signal ground, comprising:

first voltage supply means for supplying a first voltage referenced to the signal ground;

a first resistance connected at one end to the first voltage and connected at its other end to the input signal;

a second resistance connected at one end to the other end of the first resistance;

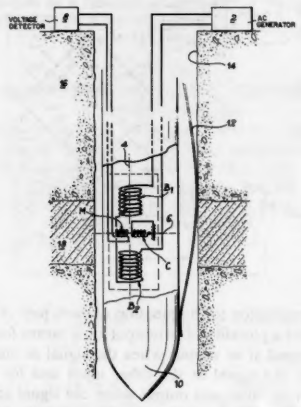
second voltage supply means for supplying a second voltage referenced to the signal ground and which is of the opposite polarity and the same magnitude as the first voltage; and

a third resistance connected at one end to the other end of the second resistance and at the other end to the second voltage, having a resistance equal to the first resistance minus the second resistance, whereby the DC component of the input signal is absent from the compensated signal present at the junction of the second and third resistances.

4,277,750
INDUCTION PROBE FOR THE MEASUREMENT OF MAGNETIC SUSCEPTIBILITY

Jean Bonnet, Chatillon, and Julien Fournet, Connaux, both of France, assignors to Compagnie Generale des Matieres Nucleaires (COGEMA Groupe C.E.A.), Paris, France

Filed Feb. 22, 1979, Ser. No. 14,100
Claims priority, application France, Feb. 24, 1978, 78 05330
Int. Cl.³ G01R *33/16*; G01V *3/28*
U.S. Cl. 324—201 **2 Claims**



1. A probe for the measurement of magnetic susceptibility of the type comprising an axis and two coaxial inductance windings for generating two magnetic inductions opposite in direction, said windings being mounted in opposition and having an axis parallel to the axis of the probe and being connected to a generator for producing alternating current at a predetermined frequency, and a measurement winding for measuring a magnetic induction between said two coaxial inductance windings, said measurement winding being placed between the two inductance windings and off-center with respect to said axis of said inductance windings, said measurement windings having an axis perpendicular to the axis of said two inductance windings, said measurement winding being connected to means for detecting a voltage at the frequency of said generator, wherein said measurement probe further comprises a compensation winding for reinforcing the induction produced in the measurement winding, said compensation winding being off-center with respect to the axis of said two coaxial inductance windings, said compensation winding being symmetrical with said measurement winding with respect to said axis of said two coaxial inductance windings.

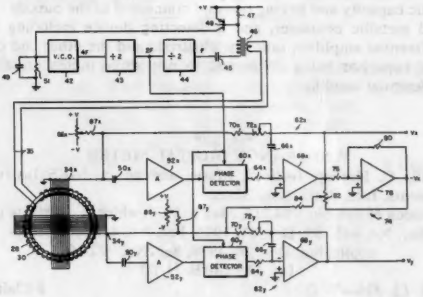
4,277,751
LOW-POWER MAGNETOMETER CIRCUIT WITH CONSTANT CURRENT DRIVE

Kenneth D. Lawson, Cataumdet, and Neil L. Brown, Falmouth, both of Mass., assignors to Neil Brown Instruments Systems, Inc., Cataumet, Mass.

Filed Sep. 29, 1978, Ser. No. 947,254
Int. Cl.³ G01R *33/04*; G01C *17/28*
U.S. Cl. 324—254 **19 Claims**

1. In a magnetometer of the type having a toroidal core, a drive winding wound around the core so as to create a circumferential field within the core, drive means for driving the drive winding with an A.C. signal so that the field from the drive winding causes the core to saturate during at least a part of each cycle of the A.C. signal, and at least one sense winding and an associated signal processing channel responsive to signals from the sense winding for detecting a component of a surrounding magnetic field, the improvement comprising:

means for sensing the current flowing in the drive winding and for producing an intermediate signal representative thereof; and

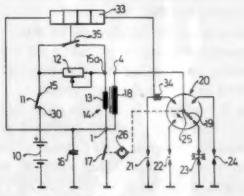


wherein the drive means includes means, responsive to the intermediate signal, for varying the frequency of the A.C. signal so as to tend to maintain a substantially constant average current flowing in the drive winding.

4,277,752
DEVICE FOR TESTING IGNITION SYSTEM OF A COMBUSTION ENGINE

Walter Dinkelacker, Stuttgart, and Jüergen Knöedler, Remshalden-Grunbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,138
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811573
Int. Cl.³ G01M *19/02*
U.S. Cl. 324—399 **5 Claims**



1. A device for testing an ignition system of a combustion engine having an electrical power source, an ignition coil connectable to said power source, a plurality of spark plugs each associated to a respective cylinder, a distributor for successively connecting respective plugs to said coil and means for variably reducing the energy of the ignition coil, comprising switching means for selectively testing the efficiency of each respective cylinder, said switching means including a scaler having a plurality of stages assigned respectively to corresponding cylinders of the engine, a synchronization input coupled to a preselected cylinder to set the scales to a starting condition when the ignition process in said preselected cylinder is about to be initiated, a counting input controlled by the pulses derived from the activation of respective cylinders of the engine, an output for delivering an output pulse when a predetermined number of input pulses has been attained, and a switching member controlled by said output pulse and controlling the energy reducing means.

4,277,753

RECTIFIER CIRCUITS

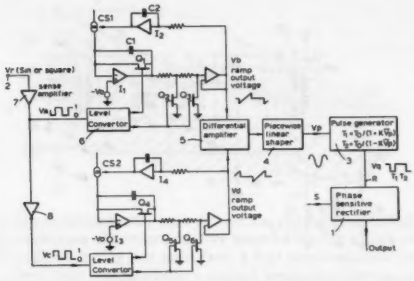
Eric A. Faulkner, Cookham, England, assignor to Brookdeal Electronics Limited, Bracknell, England

Continuation-in-part of Ser. No. 849,712, Nov. 8, 1977. This application Jun. 11, 1979, Ser. No. 47,565

Claims priority, application United Kingdom, Nov. 16, 1976, 47721/76

Int. Cl.³ H03Q *5/00*; H03K *5/00*

U.S. Cl. 328—26 **5 Claims**



1. A phase-sensitive rectifier including: a signal input terminal to which a signal to be rectified is applied; a reference input terminal to which a reference signal is applied; and means for deriving a switching signal from the reference signal for repetitively switching the signal to be rectified to obtain phase-sensitive rectification, said means comprising a control signal generator for generating a low-distortion sinusoidal control signal of frequency equal to the frequency of the reference signal, and a switching signal generator which utilizes the said control signal for generating a switching signal having spaces of interval T1 and marks of interval T2 given by

$$T1 = T0/(1+kVp)$$

$$T2 = T0/(1-kVp)$$

where Vp is the mean value of the control signal during the relevant interval and T0 and k are constants chosen so that the output of the rectifier is substantially insensitive to harmonic frequencies of the control signal.

4,277,754

DIGITAL FREQUENCY-PHASE COMPARATOR

Hiroshi Minakuchi, Kodoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 23, 1979, Ser. No. 87,370

Int. Cl.³ H03D *13/00*

U.S. Cl. 328—133 **36 Claims**

1. A frequency comparator having first and second input lines to which input pulses are supplied, comprising:

a first frequency detector for generating an output signal in response to there being two or more leading edge transitions of the input pulses supplied to said first input line during the interval between two leading edge transitions of the input pulses supplied to said second input line;

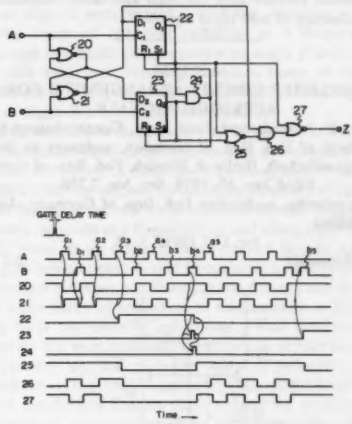
a second frequency detector for generating an output signal in response to there being two or more leading edge transitions of the input pulses supplied to said second input line during the interval between two leading edge transitions of the input pulses supplied to said first input line;

a first bistable element arranged to be set in response to the output signal of said first frequency detector;

a second bistable element arranged to be set in response to the output signal of said second frequency detector;

means for resetting said first and second bistable elements in response to both of said first and second bistable elements becoming a set condition; and

means connected to output terminals of said first and second bistable elements for generating an output signal representative of the difference in frequency between the input pulses supplied to said first and second input lines.



4,277,755

CIRCUIT ARRANGEMENT FOR DRIVING NONLINEAR THRESHOLD DEVICES

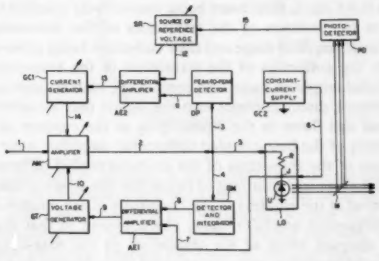
Alfredo Fausone, and Vittorio Seano, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Oct. 4, 1979, Ser. No. 81,931

Claims priority, application Italy, Oct. 5, 1978, 69299 A/78

Int. Cl.³ H03D *3/04*

U.S. Cl. 330—128 **6 Claims**



1. A circuit arrangement for driving a nonlinear device, comprising:

adjustable amplifier means having an output connected via a series impedance to the nonlinear device to be driven;

a supply of biasing connected to said nonlinear device for establishing a predetermined operating point in the absence of an input signal fed to said amplifier means;

integrating means connected to said output for establishing a base-level voltage proportional to a no-signal value of a driving voltage appearing on said output;

comparison means with input connections to said integrating means and to said nonlinear device for receiving an instantaneous load voltage developed across the latter, together with said base-level voltage, and emitting an error signal proportional to the difference between said load and base-level voltages; and

control means connected between said comparison means and said amplifier means for modifying said driving voltage in response to said error signal so as substantially to eliminate current flow through said series impedance in the absence of said input signal.

4,277,756
AMPLIFIER CIRCUIT ARRANGEMENT FOR APERIODIC SIGNALS

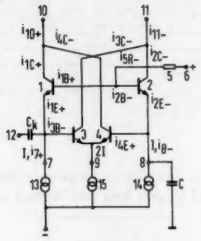
Hans Kriedt, Munich, and Josef Fenk, Guenzenhausen Ottenburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 30, 1979, Ser. No. 7,780

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1978, 2804064

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—261 **2 Claims**



1. Amplifier circuit arrangement for aperiodic signals with a base-coupled differential amplifier stage in which two transistors are directly coupled with their bases, in which the emitters of the transistors form two inputs, whereby a signal can be fed into one of the inputs and the respectively other input is capacitively applied to reference potential, and in which output signals can be topped at the collectors of the transistors, comprising a further emitter-coupled differential amplifier stage with two transistors whose emitters are directly coupled and lie at a third input, their bases being respectively coupled to an input at the emitters of the transistors of the base-coupled differential amplifier stage and their collectors being cross-coupled to the collectors of the transistors of the base-coupled differential amplifier stage, and comprising such an impression of quiescent direct currents into the inputs that a current of identical size flows in the inputs lying at the emitters of the transistors of the base-coupled differential amplifier stage and the bases of the transistors of the emitter-coupled differential amplifier stage and a current of twice this size flows across the third input at the emitters of the transistors of the emitter-coupled differential amplifier stage, characterized in that the directly coupled bases of the transistors of the base-coupled differential amplifier stage are coupled via a resistor to a post for a supply potential.

4,277,757
TWO STAGE RF AMPLIFIER

Richard A. Kennedy, Russiaville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1979, Ser. No. 100,470

Int. Cl.³ H03F *3/16*; F03F *3/193*

U.S. Cl. 330—300 **1 Claim**

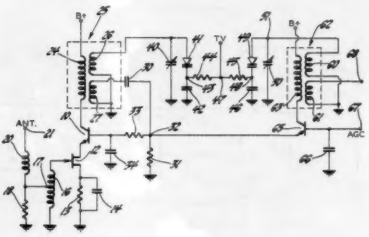
1. A radio frequency amplifier comprising, in combination:

a first stage comprising a common source JFET having source, gate and drain in cascade combination with a first common base bipolar transistor having emitter, base and collector, the JFET gate comprising an RF input to the amplifier;

a second stage comprising a second common base bipolar transistor having emitter, base and collector, the collector comprising an RF output for the amplifier;

a tuned circuit coupling the first and second stages at a predetermined RF frequency; whereby an RF signal path is provided between the amplifier input and output with gain in each stage;

means effective to establish an AGC voltage on the base of the second bipolar transistor, whereby the gain of the second stage is controlled in accordance with the AGC voltage;



means connecting the emitter of the second bipolar transistor in series with the base of the first bipolar transistor, whereby the second bipolar transistor is effective to provide amplified direct drive current for the first bipolar transistor and thus control the gain of the first stage in accordance with the AGC voltage, the second bipolar transistor thus providing amplification simultaneously for RF and AGC signals.

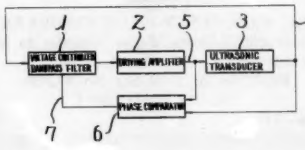
4,277,758
ULTRASONIC WAVE GENERATING APPARATUS WITH VOLTAGE-CONTROLLED FILTER

Shoji Mishiro, Kawasaki, Japan, assignor to Taga Electric Company, Limited, Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 65,161

Int. Cl.³ H03L *7/00*

U.S. Cl. 331—1 R **5 Claims**



1. An ultrasonic wave generating apparatus comprising:

ultrasonic transducer means for producing ultrasonic waves and a vibratory velocity signal;

driving amplifier means for driving said ultrasonic transducer means;

phase comparator means for comparing the output of said driving amplifier means with the said vibratory velocity signal for detecting a shifted value from a predetermined phase difference and producing a phase difference signal in response thereto;

a voltage controlled band-pass filter means, said phase difference signal controlling said voltage controlled band-pass filter means;

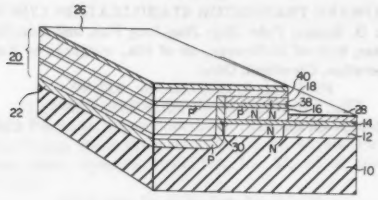
said voltage controlled band-pass filter means being directly connected to said vibratory velocity signal in a feedback loop.

4,277,759

SEMICONDUCTOR LASER DEVICE

Toshio Tanaka; Hirofumi Namizaki; Saburo Takamiya, and Wataru Susaki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1979, Ser. No. 40,085
Claims priority, application Japan, Jul. 10, 1978, 53-84408
Int. Cl.³ H01S 3/19
U.S. Cl. 331—94.5 H 20 Claims



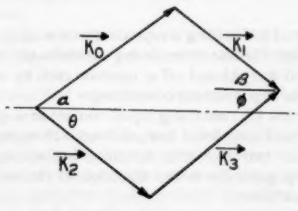
1. In a semiconductor laser device, the combination comprising: a substrate of semiconductive material having a high resistivity and including one main face, a first semiconductor layer of a first type conductivity, a second semiconductor layer of said first type conductivity, a third semiconductor layer of said first type conductivity, a fourth semiconductor layer of a second type conductivity and a fifth semiconductor layer of said first type conductivity successively grown on said main face of said substrate to form a multi-layer structure thereon, said second layer being formed of a semiconductive material narrower in forbidden band-width than that of said first semiconductor layer, said third layer being formed of a semiconductive material broader in forbidden band-width than that of said second semiconductor layer, a semiconductor region of said second type conductivity disposed on the surface portion of said fifth semiconductor layer and in one lateral portion of said multi-layer structure to extend from the surface of said fifth semiconductor layer and reach said substrate thereby to form PN junctions in said first, second, third and fifth semiconductor layers respectively, said second semiconductor layer of said first type conductivity including an exposed surface portion on the other lateral portion of said multi-layer structure formed by removing those portions of said fifth, fourth and third semiconductor layers located in said other lateral portion of said multi-layer structure, a first electrode disposed in ohmic contact with said exposed surface portion of said second semiconductor layer, and a second electrode disposed in ohmic contact with the remaining portion of said surface of said fifth semiconductor layer.

4,277,760

CROSSED-BEAM PHASE-MATCHED COHERENT ANTI-STOKES RAMAN SPECTROSCOPY

Alan C. Eckbreth, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1979, Ser. No. 25,649
Int. Cl.³ H01S 3/30
U.S. Cl. 331—94.5 N 4 Claims



1. In a method of generating coherent anti-Stokes Raman radiation in a medium of interest disposed around a point along an axis, the steps of:

simultaneously directing a first pump beam of coherent radiation at a frequency ω_0 through said point along a path at an angle α with respect to said axis, directing a second pump beam of coherent radiation at a frequency ω_1 through said point along a path at an angle β with respect to said axis, and directing a Stokes beam of coherent radiation at a frequency ω_2 through said point along a path at an angle θ with respect to said axis;

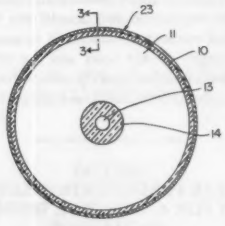
focusing said beams so that each of said beams converges to its minimum beam cross-section area substantially at said point, the center of each beam crossing each other beam substantially at said point, whereby three wave mixing of said beams generates an anti-Stokes Raman beam of coherent radiation at a frequency ω_3 and along a line through said point at an angle Φ with respect to said axis, said angles being related to said frequencies by the relationship $n_0\omega_0 \cos \alpha + n_1\omega_1 \cos \beta = n_2\omega_2 \cos \theta + n_3 \cos \Phi$, where n_0 is the index of refraction of said medium at frequency ω_0, n_1 is the index of refraction of said medium at frequency ω_1, n_2 is the index of refraction of said medium at frequency ω_2, and n_3 is the index of refraction of said medium at frequency ω_3, whereby the spatial resolution of said anti-Stokes Raman beam generation is limited to a volume of said medium along said axis within which all three of said directed beams coexist.

4,277,761

METHOD OF COATING METAL ON A GLASSY BODY SURFACE AND RESULTING ARTICLE

Robert M. Silva, Dayton, and Fred D. Orazio, Jr., Centerville, both of Ohio, assignors to VTI, Inc., Dayton, Ohio

Filed May 21, 1979, Ser. No. 40,655
Int. Cl.³ H01S 3/00; B05D 3/14
U.S. Cl. 331—94.5 T 15 Claims



1. A method of adhering a metal coating to the surface of a body of glassy material adapted to be used as the body for a gas laser, comprising the steps of cleaning the surface to remove contaminents such as dust or grease, placing the body into a vacuum chamber, heating the body to remove water vapor, removing gas from the chamber to reduce the pressure within the chamber below atmospheric pressure, exposing the surface to oxygen ions while the pressure is reduced causing oxygen to adhere to the surface, coating the surface with a metal while the pressure is reduced within the chamber to form a chemical bond between the metal and the body, removing the body with the coated metal surface from the chamber while the body is hot, inserting the body into a second chamber filled with helium to saturate the body with helium, cooling the body while in the second chamber, and increasing the pressure within the second chamber.

2. The assembly comprising a gas laser body of glassy material having an outer surface and defining a lasing chamber, a gas containing helium within said chamber, means for exciting the gas, a coating of copper overlying said outer surface, and said copper coating being chemically bonded to said outer surface by oxygen.

3. The assembly comprising a hollow body of glassy material having a surface and defining a chamber adapted to confine helium, a coating of copper overlying said surface, and said copper coating being chemically bonded to said surface by oxygen.

4,277,762

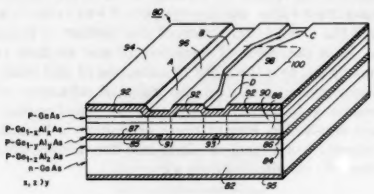
MODE CONTROL OF HETEROJUNCTION INJECTION LASERS AND METHOD OF FABRICATION

Donald R. Scifres, Los Altos; William Streifer, Palo Alto, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 869,190, Jan. 13, 1978, Pat. No. 4,185,256. This application Jul. 27, 1979, Ser. No. 61,539

Int. Cl.³ H01S *3/19*

U.S. Cl. 331—94.5 H **7 Claims**



1. In a heterostructure injection laser including a semiconductor body having a light emitting active layer, at least two adjacently disposed elongated current confinement means associated with the upper surface of said body and extending the length thereof to form two current confinement channels in said active layer producing at least two optical paths for light wave propagation under lasing conditions, said current confinement means being sufficiently close to one another in one region of their length so that exponentially decaying light from one optical path can extend and couple into the other optical path, one of said current confinement means is substantially linear for the length of said body and the other said current confinement means is at least partly curved for a portion of the length of said body to form said one region along their optical paths.

4,277,763

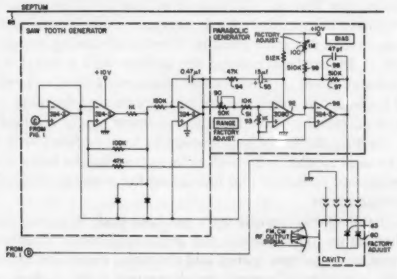
NON-LINEAR PREDISTORTION LINEARIZING CIRCUIT FOR A VARACTOR DIODE TUNED OSCILLATOR

William H. Ward, Jr., 1561 Mesa Dr., Costa Mesa, Calif. 92626

Division of Ser. No. 879,464, Feb. 21, 1978. This application Dec. 8, 1978, Ser. No. 967,882

Int. Cl.³ H03C *3/22*

U.S. Cl. 331—96 **4 Claims**



3. In a linearizing circuit for an oscillator including an rf cavity, means for generating a non-linear predistortion factor to be applied to a signal supplied to a tuning means for said oscillator, said predistortion means, comprising:

an operational amplifier receiving a signal from a linear sweep signal generating means; and

passive means connected to said amplifier bias input for causing a signal at the output of said amplifier that is the square of the input signal thereto.

4,277,764

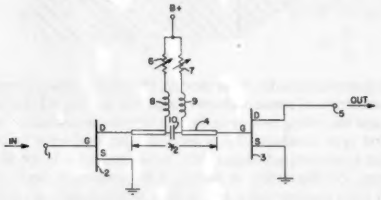
MICROWAVE TRANSISTOR STABILIZATION CIRCUIT

Charles D. Rosier, Palm Bay; Jing-Jong Pan, and Donald K. Belcher, both of Melbourne, all of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Aug. 9, 1978, Ser. No. 932,305

Int. Cl.³ H03H *11/04;* **H03F** *3/16, 3/191*

U.S. Cl. 333—24 C **7 Claims**



1. A microwave transistor circuit comprising a transmission line having a length equal to one-half of the wavelength of the center frequency of a selected microwave frequency band, and first and second transistors connected in cascade by said transmission line, said transmission line having a gap therein and further including a capacitor connected to said transmission line in said gap.

4,277,765

DEVICE FOR COOLING A SUPERCONDUCTIVE RESONATOR AND METHOD OF MAKING THE DEVICE

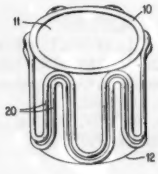
Laszlo Szecsi, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,425

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2809913

Int. Cl.³ H01P *7/06, 11/00*

U.S. Cl. 333—99 S **10 Claims**



1. In a device for cooling a superconductive resonator with a liquid coolant; the resonator having a rotationally symmetrical cylindrical body closed off at opposite ends by respective end plates; the improvement comprising

(a) a first tube for containing liquid coolant arranged externally of said cylindrical body in heat-exchanging contact therewith; said first tube having a meandering course extending generally in the direction of the axis of said cylindrical body;

(b) second tubes for containing liquid coolant arranged externally of each said end plate in heat-exchanging contact therewith; each said second tube having a spiral

course extending symmetrically with respect to said axis; and

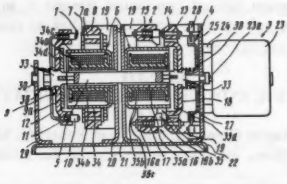
(c) diffusion welds connecting said first tube to said cylindrical body and said second tubes to the respective said end plates.

4,277,766

ELECTRIC CIRCUIT SWITCHING DEVICE

Vitaly I. Koshman, bulvar Shevchenko, 123, kv. 25; Vladimir F. Petrichenko, ulitsa Prozhektornaya, 6, kv. 44, and Pavel V. Kamshitsky, prospekt Mira, 53a, kv. 23, all of Donetsk, U.S.S.R.

Filed Apr. 20, 1979, Ser. No. 32,020
Int. Cl.³ H01H 67/06
U.S. Cl. 335—122 4 Claims



1. An electric circuit switching device comprising:

a group of closing contact pairs having

an insulating panel,

stationary contacts arranged along the circumference of said insulating panel, and

a switching element;

a group of breaking contact pairs having

a main insulating panel,

stationary contacts arranged along the circumference of said insulating panel,

spring-loaded contacts forming with said stationary contacts breaking contact pairs, and

a switching element actuating said spring-loaded contacts while disconnecting said breaking contact pairs;

a unit for rotating said switching elements having

a rotary electromechanical drive provided with an output shaft, and

means for setting an angle of rotation of the output shaft of said rotary electromechanical drive depending on the position of said stationary contacts to be commutated on said insulating panels; and

an electromagnetic drive having

a first electromagnet providing translatory motion of said switching element of said group of the closing contact pairs,

a second electromagnet providing translatory motion of said switching element of said group of the breaking contact pairs,

each of said first and second electromagnets having a winding,

a hollow core supporting said winding and embracing the output shaft of said rotary electromechanical drive, and

an armature rigidly connected to a respective switching element and electrically insulated therefrom,

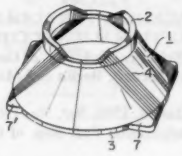
said armature being mounted for movement along the output shaft of said rotary electromechanical drive and having a recoil spring.

4,277,767

DEFLECTION YOKE

Mitsugu Ura, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1980, Ser. No. 115,407
Claims priority, application Japan, Jan. 26, 1979, 54-7733[U]
Int. Cl.³ H01F 5/00
U.S. Cl. 335—210 2 Claims



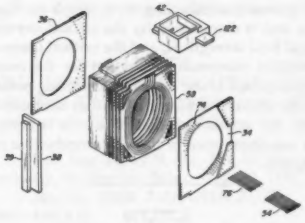
1. A deflection yoke comprising a core of magnetic material in the form of a truncated cone having a large-diameter end and a small-diameter end, said small-diameter end having two recesses each having sloping portions, located diametically opposite to each other; projections provided at said large-diameter end, located diametically opposite to each other and extending out perpendicular to the axis of said core, the straight line passing through the centers of said recesses being perpendicular to the straight line passing through the centers of said projections, and the outer end of each of said projections having a symmetrical V-shaped concavity; and a coil wound in a toroidal manner on said core, passing on the edges of said sloping portions of said recesses of the small-diameter end and the edges of said V-shaped concavities of said projections.

4,277,768

SUPERCONDUCTING MAGNETIC COIL

John E. Burgeson, and Dennis W. Lieurance, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Nov. 24, 1978, Ser. No. 963,556
Int. Cl.³ H01F 7/22
U.S. Cl. 335—216 6 Claims



1. A superconducting coil comprising:

a structural helix having a plurality of substantially flat windings;

a plurality of electrical conductors disposed on a surface of said structural helix windings, each of said conductors shaped to provide a raceway;

a plurality of electrical superconductors, one of said superconductors disposed within each of said conductor raceways;

each of said superconductors comprising a substantially transposed multi-strand superconductor;

an insulator disposed between each winding of said structural helix;

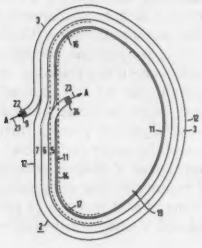
at least one radial slot in each of said structural helix windings;

a container surrounding said structural helix, said container adapted for the storage of a cryogenic fluid therein;
a plurality of insulation bushings disposed to pass through said structural helix; and
a plurality of bolts disposed to pass through opposite sides of said container and located within said insulation bushings to firmly compress said container sides and said helix windings into a rigid pack.

4,277,769
ARRANGEMENT FOR COOLING A SUPERCONDUCTION MAGNET COIL WINDING

Hans Hieronymus, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 9, 1980, Ser. No. 110,105
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901333
Int. Cl.³ H01F *7/22*
U.S. Cl. 335—216 **5 Claims**



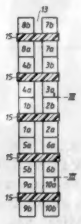
1. In an arrangement for cooling a magnet coil winding containing conductors of superconductive material which are cooled by means of a forced flow of a coolant which is fed into the winding at at least one coolant connecting point and is discharged again from the winding at at least one further coolant connecting point, the conductors being subdivided into conductor zones, the operating points of which, being fixed by the current density I, the field strength H and the temperature T, have a different deviations from the transition point of the superconductive material from the superconducting to the normally conducting state which is closest in the I-H-T space and is determined by the critical current density I_c, the critical field strength H_c and the critical temperature T_c, the improvement comprising, an outlet for the coolant from the winding disposed at the coolant connecting point with the comparatively shortest distance from that conductor zone of the winding, the operating point of which is comparatively closest to a transition point of the superconductive material in the I-H-T space.

4,277,770
REGULATING WINDING STRUCTURE FOR TRANSFORMER

Gunnar Jorendal, and Adrian von Renteln, both of Ludvika, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Sep. 28, 1979, Ser. No. 79,989
Claims priority, application Sweden, Oct. 2, 1978, 7810281
Int. Cl.³ H01F *27/08, 15/14*
U.S. Cl. 336—60 **4 Claims**

1. A regulating winding for a transformer, comprising:
a substantially cylindrical winding body with two end portions;
a plurality of substantially helical conductors, each helical conductor extending between said end portions and including a plurality of turns and composed of at least two substantially helical conductor strands parallelly connected with each other;
said helical conductors being serially interconnected by means of transitions;
the conductor strands of each said helical conductor are mutually oppositely disposed such that a plurality of surfaces of said helical conductor strands form at least a portion of a plurality of cooling channels;

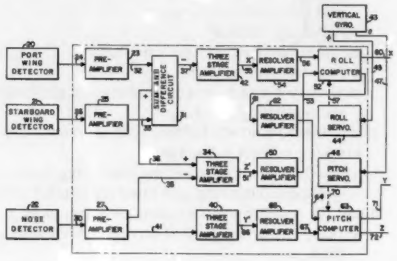


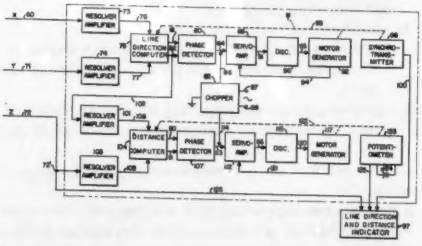
a plurality of interspaces being formed between said cooling channels, each including a pair of mutually adjacent helical conductor strands; and
the voltage between mutually opposed points of said mutually adjacent helical conductor strands is higher than twice the voltage across any of said helical conductors.

4,277,771
ELECTRIC INDUCTION FIELD NAVIGATION APPARATUS

Lawrey H. Chapin, Glendora, Calif., and Robert O. Maze, Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 14,164, Mar. 4, 1960, abandoned. This application Nov. 9, 1964, Ser. No. 410,830
Int. Cl.³ G01S *3/78*
U.S. Cl. 340—27 NA **15 Claims**





8. Apparatus usable by a dirigible craft having pitch, roll, and yaw axes for detecting an electric field about a transmission line, said apparatus comprising: first means responsive to the electric field about a transmission line of alternating current

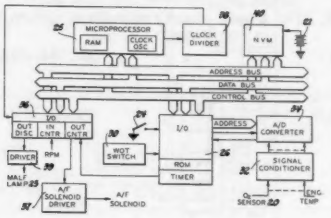
to provide output signals indicative of the orthogonal components of said electric field; second means connected to said first means and responsive to said output signals from said first means for transforming said signals from a first coordinate system descriptive of said dirigible craft to a second coordinate system representative of the earth where the yaw axis of each coordinate system remains substantially the same; third means connected to said second means and responsive to said transformed signals from said second means for computing the relative bearing of said dirigible craft to said transmission line and producing output signals representative thereof; fourth means connected to said second and third means and responsive to output signals from said second and third means for computing a function of the distance of said dirigible craft from said transmission line and producing output signals representative thereof; and fifth means responsive to said output signals from said third and fourth means for displaying the quantities computed.

4,277,772

MOTOR VEHICLE DIAGNOSTIC AND MONITORING SYSTEM

John L. Kastura, and David O. Enyart, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1980, Ser. No. 160,152
Int. Cl.³ G08B *19/00*
U.S. Cl. 340—52 F **3 Claims**



1. A diagnostic monitoring system for monitoring predetermined parameters in a motor vehicle comprising, in combination:

fault indicating means, the fault indicating means having a first state indicating a fault-free condition and a second state indicating a fault condition;

a temporary storage register for storing fault conditions;

counting means effective to store a count;

means effective to detect fault conditions in the predetermined parameters; and

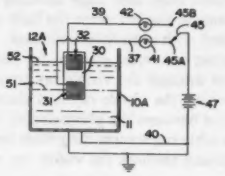
means effective to (a) store detected fault conditions in the temporary storage register only when said temporary storage register is cleared of all stored fault conditions, (b) clear each terminated fault condition from the temporary storage register at the time said fault condition terminates, (c) recurrently increment the count in the counting means during the period that a malfunction is stored in the temporary storage register, (d) set the fault indicating means to the second state to provide an indication of a fault condition when the count in the counting means attains a first predetermined count, and (e) preset the count in the counting means to a second predetermined count that is less than the first predetermined count when the temporary storage register is cleared of all storage malfunctions when the count is intermediate the first and second counts, the difference between the first and second counts establishing a predetermined minimum time period required for a fault condition to exist before the fault indicating means is set to the second state to indicate a fault condition.

4,277,773

LIQUID LEVEL SENSOR

Edward F. Blatnik, P.O. Box 764, Riverview, Fla. 33569

Continuation-in-part of Ser. No. 742,777, Nov. 18, 1976, abandoned. This application Dec. 29, 1978, Ser. No. 663
Int. Cl.³ B60Q *1/00*; G08B *21/00*
U.S. Cl. 340—59 **9 Claims**



1. An apparatus for cooperation with an existing opening within a cooling radiator of a vehicle to determine the liquid level in the radiator, the radiator being connected to an electrical power source of the vehicle, comprising in combination:

insulator means established relative to the vehicle radiator in a substantially fixed relation;

sensor means mounted to said insulator means for extending into the liquid in the radiator when a sufficient quantity of liquid is contained therein;

said sensor means including a conductor having a plurality of curved portions interconnected by a plurality of linear portions;

said plurality of linear portions of said sensor means each extending parallel to the surface level of the liquid with substantially identical surface area regions of each of said plurality of linear portions being immersed in the liquid for a given liquid level;

said plurality of curved portions and said plurality of linear portions increasing the surface area of said sensor means to provide increased electrical contact with the liquid in the cooling radiator; and

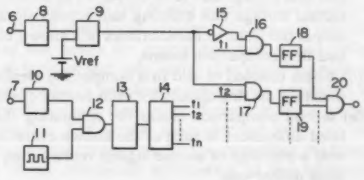
an electro-optical indicator means interconnecting in series with said sensor means and the electrical power source of the vehicle for indicating the level of the liquid contained in the radiator by illuminating said electro-optical indicator means exclusively by the electrical conductivity through the liquid in contact with said sensor means.

4,277,774

BILL DISCRIMINATING APPARATUS

Kiyoshi Fujii; Keiji Tsuji, and Seiya Nishimoto, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1979, Ser. No. 69,768
Claims priority, application Japan, Aug. 28, 1978, 53-104752
Int. Cl.³ G06K *7/12*; G01N *21/30*
U.S. Cl. 340—146.3 Q **5 Claims**



1. A bill discriminating apparatus for discriminating genuine bills from counterfeit bills by irradiation of ultraviolet rays, said genuine bills having a printed zone containing a light emitting substance having patterns, said apparatus comprising:

an ultraviolet ray-emitting member for emitting an ultraviolet ray and directing it toward a bill to be discriminated,

an ultraviolet ray transmitting filter disposed between the ultraviolet ray emitting member and the bill to be discriminated for passing only the ultraviolet ray through the filter,

a visible ray transmitting filter for passing only the visible ray reflected from said light emitting substance in said printed zone of the bill when the light emitting substance is irradiated with ultraviolet radiation,

a photoelectric converter element for receiving the visible ray passed through the visible ray transmitting filter and for converting the visible ray into electric signals,

a slit disposed between the photoelectric converter element and the visible ray transmitting filter for limiting the visible ray passed through the visible ray transmitting filter, and

a discriminating circuit for checking said patterns of the light-emitting substance in response to the electric signals of said photoelectric converter element;

wherein said discriminating circuit comprises a first circuit for generating pattern signals from light rays received in said photoelectric converter element, a second circuit for generating a train of pulses corresponding to the pattern signals obtained from a genuine bill, and a third circuit for comparing said pattern signals with said train of pulses.

4,277,775

CHARACTER RECOGNITION SYSTEM

Robert B. Nally; James F. Akister, and George Trohatos, all of Waterloo, Canada, assignors to NCR Canada LTD - NCR Canada Ltee, Mississauga, Canada

Filed Oct. 1, 1979, Ser. No. 80,952
Int. Cl.³ G06K *9/68*
U.S. Cl. 340—146.3 Q **9 Claims**

1. In a character recognition system wherein feature characteristics of an analog waveform representing an unknown character are compared with the feature characteristics of a plurality of known characters, an apparatus for recognizing the unknown character, comprising:

(a) first and second storage unit for storing the feature characteristics of an unknown character and the feature characteristics of a plurality of known characters respectively;

(b) first comparison means coupled to said first and second storage unit for comparing the location of each feature characteristic of the unknown character with the location of the feature characteristics of the known characters to produce a first signal representing the difference therebetween;

(c) first counter means operable to output a count equal to the number of feature characteristics stored in said first storage unit, said first counter means coupled to said first storage unit and outputting a plurality of counts each of which enables each of said feature characteristics stored in said first storage unit to be outputted as an address to said second storage unit enabling said second storage unit to output the feature characteristics of a known character to said first comparison means;

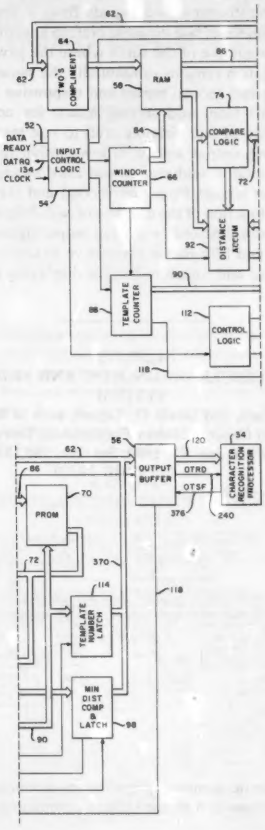
(d) means coupled to said first comparison means for accumulating the first signals for each known character;

(e) second comparison means for comparing the accumulated differences of each of the known characters to provide a plurality of second signals representing two minimum differences;

(f) first means for storing said second signals;

(g) second means for storing the known characters associated with said second signals;

(h) and processing means coupled to said first and second storing means for applying a plurality of threshold values to the difference between said second signals to enable said processing means to identify the unknown character



in accordance with the second signal having the minimum difference.

4,277,776

MAGNETIC INK CHARACTER RECOGNITION APPARATUS

Robert B. Nally; James F. Akister, and David Hulford, all of Waterloo, Canada, assignors to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Oct. 1, 1979, Ser. No. 81,491
Int. Cl.³ G06K *9/20;* **H03K** *5/153*
U.S. Cl. 340—146.3 AG **18 Claims**

1. A method for establishing the start of an analog waveform having a sequence of varying peak voltage amplitudes and times of occurrence of same corresponding to the configuration of a symbol being recognized comprising the steps of:

sampling portions of the first peak of the analog waveform to generate values representing the voltage amplitude of each portion;

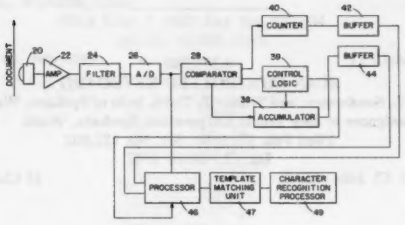
summing the voltage amplitudes of the samples taken;

counting the number of samples taken of the first peak;

dividing the sum of the voltage amplitudes by the number of samples taken to produce a threshold voltage amplitude;

comparing the voltage amplitude of each sample with the threshold voltage amplitude;

and outputting the voltage amplitude of those samples taken to a utilizing device whose voltage amplitude exceeds the



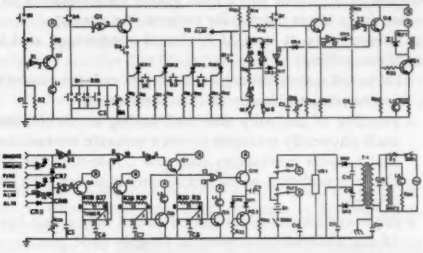
threshold voltage amplitude as representing the start of the symbol to be recognized.

4,277,777

ALARM COMBINATION LOCK

Friedemann J. Schulz, 11 Richard St., Touraine by Gatineau-Pointe, P. Quebec, Canada (J8T 1G3), assignor to Friedemann Joachim Schulz, Touraine, Canada

Filed Mar. 22, 1979, Ser. No. 22,921
Claims priority, application Canada, May 2, 1978, 302427
Int. Cl.³ G05B *1/00*
U.S. Cl. 340—147 MD **9 Claims**



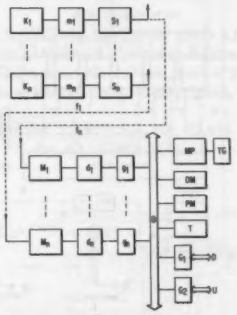
1. A code device for comparing the sequence and number of digits of a selected multi digit primary coded signal with a predetermined coded sequence and number of digits in said device, comprising a first coded selection means for initiating the operation of said device and for selecting the first digit of the code, time delay means responsive to said first selection means to provide a timed output signal of a predetermined duration, means to connect said timed signal as the operating potential to a plurality of thyristors, additional coded selection means disposed in the gate circuits of said thyristors adopted to trigger a thyristor into conduction and to deactivate the preceeding thyristor, a final coded section means for providing the output from the final thyristor to operate a controllable device, a plurality of additional selection means associated with said coded selection means, means responsive to the operation of one or more of said final additional selection means for terminating the timed output signal whereby an output is generated by said code device to operate the controllable means when all of the coded selection means are operated in the predetermined coded sequence and within the duration of said timed signal, and whereby the operation of the additional selection means or the termination of the timed signal inhibit the operational output from said device.

4,277,778

INFORMATION TRANSMITTING SYSTEM

Paul M. Persson, Flintvägen 20, S-175 61 Järfälla, Sweden

Continuation-in-part of Ser. No. 794,412, May 6, 1977, abandoned. This application Dec. 12, 1978, Ser. No. 968,855
Claims priority, application Sweden, May 10, 1976, 7605253
Int. Cl.³ H04B *1/00*; H04Q *1/45*
U.S. Cl. 340—171 A **6 Claims**



1. A system for transmission of reports, comprising:

a plurality of observation stations, each including coder means including a key set for selecting code signs corresponding to the observations, among a predetermined set of code signs, defining at least one of height, distance, type and result of fire, and character of target, each kind of observation concerning different occurrences or events comprising several of said signs, and transmitter means for transmitting the code signs in a wireless way from each observation station by way of mutually separated channels having different wavelengths; and

a central station including, for each channel, receiver means for receiving said transmitted code signs, demodulator means for generating pulse trains corresponding to the received code signs, bus means for receiving said pulse trains generated by said receiver means, and including a plurality of adapters of the asynchronous communications interference type for accomplishing a series-parallel transformation of said pulse trains at a given rate, a common adapter connected between the bus means and a presentation device, said common adapter performing parallel-series transformations at a considerably higher rate compared to said given rate of said series-parallel transformations of said plurality of adapters, clock means connected to said bus means for generating clock signals defining arrival times of said pulse trains after transformation, said common adapter transferring information completed with information about their origin derived from the plurality of adapters, and arrival times derived from the clock means, microprocessor means for controlling the transferring of the completed information to the presentation device, and two memories connected to the bus, one memory for holding a program which is permanent and indestructible, and the other memory comprising a temporary storage device for storing incoming data reports presented together to the presentation device.

4,277,779

TIME CODE GENERATOR

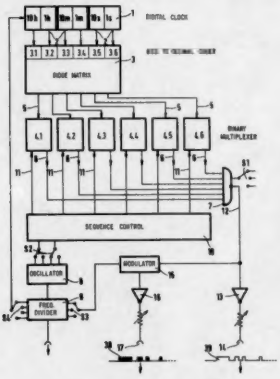
Hans-Adolf Rohrbacher, Karlsdorf, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,996

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853541

Int. Cl.[3] G08C *19/28, 9/00*

U.S. Cl. 340—348 5 Claims



1. A time code generator for generating a time-coded pulse sequence comprising:

a digital clock for generating time information at six output terminals thereof in a BCD code;

six BCD-to-decimal coder stages, each stage having ten output terminals and an input coupled to a corresponding output terminal of said digital clock;

six binary multiplexer stages, each having a control input, four BCD inputs and sixteen data input terminals;

a diode matrix coupling the ten output terminals of each of said BCD-to-decimal coder stages to selected data input terminals of said binary multiplexer stages;

a clock pulse generator for generating clock pulses at a predetermined frequency, said clock pulse generator including:

a quartz crystal for generating time reference signals,

an addressing counter coupled to the BCD inputs of said binary multiplexer stages for generating the lower order addresses thereof, and

a reset stage coupled to said addressing counter for generating a reset signal after the one-hundredth clock pulse;

a decoder coupled to the control inputs of said binary multiplexer stages;

a follow-up counter coupled to said address counter and said decoder for serially energizing said binary multiplexer stages;

a frequency divider coupled to said clock pulse generator for generating pulses at predetermined submultiples of the frequency of said time reference signals, the pulses at the output of said frequency divider being coupled to and controlling said digital clock, address counter, follow-up counter, decoding and binary multiplexer stages;

a multiplexer NAND gate coupled to the outputs of said six binary multiplexer stages;

a mode switch connected to the output of said NAND gate;

first and second output signal amplifiers coupled to said mode switch;

a modulator having its output coupled to the input of said second output signal amplifier; and

a modulator switch for connecting the output of said frequency divider to said modulator, the output of said first signal amplifier being unmodulated and the output of said second signal amplifier being modulated by an output of said frequency divider.

4,277,780

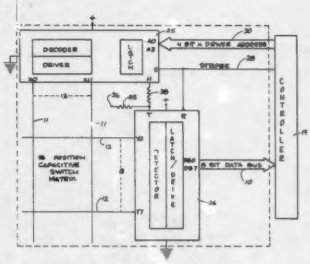
SCAN-CONTROLLED KEYBOARD

Ed L. Sonderman, and Walter Z. Davis, both of Spokane, Wash., assignors to Key Tronic Corporation, Spokane, Wash.

Filed Feb. 15, 1980, Ser. No. 121,902

Int. Cl.[3] G06F *3/02*

U.S. Cl. 340—365 S 15 Claims



1. A keyboard having a plurality of analog keyswitches arranged in M columns and N rows adapted to be scan controlled by a digital controller directly connected thereto wherein both M and N are integers greater than one and the digital controller has a data bus with at least N lines, a keyboard scan set strobe and a reset strobe for generating strobe pulses, and address outputs for transmitting a selected bit code for interrogating at least M keyboard conductors, said keyboard comprising:

a keyboard matrix having a plurality of column conductors intersecting a plurality of row conductors;

a plurality of manually activated analog keyswitch means each physically arranged across a separate intersection of said column conductors and row conductors for selectively completing an electrical circuit across such intersection;

a single multi-terminal integrated circuit driver chip having M output terminals connected directly to M column conductors of the keyboard matrix, said driver chip also having a strobe terminal and a plurality of address terminals adapted to be connected to outputs of a digital controller;

said driver chip having internal decoding means for selecting a column conductor corresponding to an address code received at its address terminals and stored internally, causing a signal to be applied on each row conductor having a keyswitch means activated across an intersection with the selected column conductor on the keyboard matrix in a timed relation to a strobe pulse received at its strobe terminal;

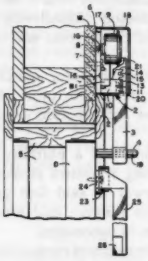
and a single multi-terminal integrated circuit detector chip having N input terminals individually connected directly to N row conductors of the keyboard matrix and N output terminals adapted to be individually connected to N lines of the data bus of the digital controller, said detector chip also having a reset terminal adapted to be connected to an output of the digital controller;

said detector chip having internal individual current sensing means connected to each of its input terminals for detecting a signal applied on a row conductor of the keyboard matrix and generating a digital pulse in response thereto at its corresponding output terminal.

4,277,781
CLOSURE ALARM WITH THREE-WAY SWITCH

Steve Hunyadi, Pepper Pike, Ohio, assignor to Castle Keep, Inc., Wickliffe, Ohio

Filed Mar. 7, 1980, Ser. No. 127,934
Int. Cl.³ G08B *13/08*
U.S. Cl. 340—545 11 Claims

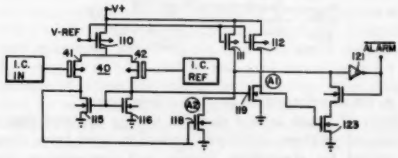


1. An alarm for detecting opening movement of a closure member for an opening in a building structure comprising an alarm unit adapted for fixed mounting adjacent said closure member; said unit having an electrically operated alarm signal means, a switch, and a battery electrically interconnected to energize and deenergize said signal means upon closing and opening of said switch; said switch comprising a pair of coaxial rounded-end contacts which are spring biased into end-to-end contact; said unit having a switch operating lever pivotally connected thereto about an axis parallel to that of said contacts; said lever having a thin blade-like insulated portion which in active position of said lever is wedged between said contacts to open said switch and which is withdrawn therefrom to close said switch upon swinging of said lever in response to opening movement of said closure member; said lever having another thin blade-like insulated portion which is interposed between said contacts in an inactive position of said lever whereat said lever clears the path of opening and closing movements of said closure member.

4,277,782
DETECTION CIRCUIT AND STRUCTURE THEREFOR

Robert L. Chao, Sunnyvale, Calif., assignor to Supertex, Inc., Sunnyvale, Calif.

Livision of Ser. No. 880,035, Feb. 22, 1978, Pat. No. 4,215,281.
This application Nov. 13, 1979, Ser. No. 93,517
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—661 3 Claims



1. An integrated circuit comparator circuit having a predetermined hysteresis of operation including in combination:

differential amplifier means having first and second input terminals and first and second output terminals;

first gating means having an input coupled to said first output terminal of said differential amplifier, an output terminal, and displaying a hysteresis of operation;

alarm means coupled to the output terminal of said first gating means and adapted to provide an alarm when said first gating means is operative to gate a differential signal from said first output terminal of said differential amplifier to said alarm means;

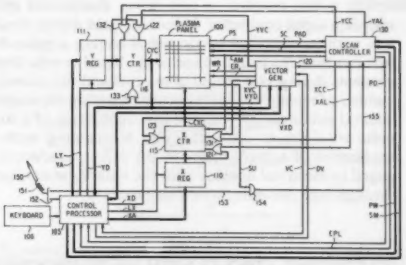
second gating means having an input coupled to said second output terminal of said differential amplifier, an output terminal, and displaying greater hysteresis of operation than said first gating means; and

alarm continuity means having an input connected to the output terminal of said second gating means, an output terminal coupled to said alarm means, and being adapted to cause said alarm means to continue to provide an alarm so long as said hysteresis of operation of said second gating means maintains said second gating means open.

4,277,783
LIGHT PEN TRACKING METHOD AND APPARATUS

Eugene E. Sampieri, Freehold Township, Monmouth County, and Thomas P. Sosnowski, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 2, 1979, Ser. No. 53,916
Int. Cl.³ G08B *5/36*
U.S. Cl. 340—708 32 Claims



1. A method for use in a display system which includes a display medium (100) comprised of a plurality of selectively energizable display sites, means (105, 110, 111, 115, 116, 130) for causing selected ones of said display sites to flash in a selected order, a light pen (150) adapted to be moved adjacent to said display medium, said light pen generating a signal when a display site adjacent thereto flashes, and means (105, 115, 116, 130, 154) responsive to said signal for identifying as the current location of said light pen the location of said adjacent display site, said method being comprised of the step of

selecting as said ones of said display sites the display sites in a region of said display medium which includes a predicted future location of said pen.

4,277,784
SWITCH SCANNING MEANS FOR USE WITH INTEGRATED CIRCUITS

Tom M. Hyltin, Dallas, Tex., assignor to Commodore Electronics Limited, Nassau, The Bahamas

Filed Jul. 13, 1979, Ser. No. 57,166
Int. Cl.³ G08B *5/36*
U.S. Cl. 340—711 13 Claims

1. In combination:

a data display device having liquid crystal display elements each characterized by a turn-on and turn-off transition interval;

a data logic circuit having output nodes for conducting actuating signals to said liquid crystal display elements and having a data input node;

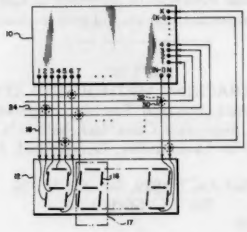
driver conductors connecting said data logic output nodes to said display elements;

a data input conductor connected to said data input node;

a switch assembly including a movable switch element for

electrically connecting the data input conductor to one of the driver conductors;

a control circuit coupled to the data logic circuit for applying the actuating signals during a load interval and interrupting the actuating signals during a sampling interval, the load interval being longer than the sampling interval and the sampling interval having a duration which is less than the turn-off time of the liquid crystal display elements; and,



sampling means coupled to said driver conductors and to said data input conductor for pulsing said driver conductors with an electrical strobe signal having a pulse duration less than the turn-on time of the liquid crystal display elements during said sampling interval and for counting a number of repetitive events occurring during the sampling interval commencing with the first application of a strobe pulse to a driver conductor and terminating with the application of a strobe pulse to the driver conductor engaged in electrical contact with the data input conductor through said movable switch element.

4,277,785

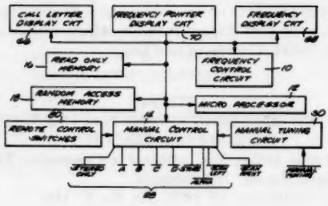
RADIO CONTROL CIRCUIT WITH MICROPROCESSOR

Larry A. Schotz, Glendale, and Thomas W. Wiesmann, Milwaukee, both of Wis., assignors to Draco Laboratories, Inc., Grafton, Wis.

Division of Ser. No. 780,391, Mar. 23, 1977, Pat. No. 4,122,395, which is a continuation-in-part of Ser. No. 684,523, May 10, 1976, abandoned. This application Jun. 16, 1978, Ser. No. 916,411

Int. Cl.³ G06F *3/14*; H04B *1/26*

U.S. Cl. 340—753 **3 Claims**



1. Means for use with a radio receiver for enabling display of characters representative of the call letters of a radio transmitting station to which said radio receiver is tuned, said means comprising:

memory means for storing a table of digital data corresponding with call letters of a plurality of radio transmitting stations and their frequencies,

means responding to said radio receiver being tuned to the frequency of a transmitting station by accessing from said memory means digital data representative of the characters which compose the call letters of said station,

character generator means having input and output means and responsive to input of digital data on its input means representative of a character to be generated by providing data on its ouput means for effecting the display of characters,

a plurality of character display units each comprising a matrix of light emitting diodes arranged in rows and columns,

a first group of semiconductor switch means for each of said display units connected respectively in circuit with a selected one of said diode rows and columns of each of said display units,

a second group of semiconductor switch means connected respectively in circuit with the other of the not previously selected diode rows and columns of each of said display units,

an electric supply line and a plurality of semiconductor switches each having a control element and operable to supply electric power to said first groups of switches, respectively, and to remove said power alternately for each of said groups in succession,

a digital counter having output means for supplying consecutive binary digital number signals at a predetermined clock frequency,

first selector means having input and ouput means and responsive to receiving signals on its input means from said digital counter by turning on one of said plurality of switches at a time to thereby supply electric power to a corresponding group of switches for supplying one of said columns and said rows of one display unit,

second selector means having input and ouput means and operable in response to signals from said digital counter means on its input means by consecutively turning on said switches in said second group to thereby enable supplying electric power to the other of said rows and said columns, and

means for supplying control signals from said character generator means consecutively to said control elements of said second group of switches synchronously with the output of said digital counter such that rows and columns corresponding with a character in only one of said display units at a time will be displayed.

4,277,786

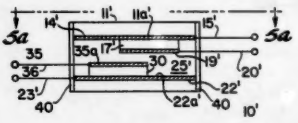
MULTI-ELECTRODE LIQUID CRYSTAL DISPLAYS

Wesley K. Waldron, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 19, 1979, Ser. No. 59,275

Int. Cl.³ G08B *5/36*

U.S. Cl. 340—765 **11 Claims**



1. A visual information display comprising:

a layer of liquid crystal material having opposed first and second surfaces, said liquid crystal material layer characterized by absorption therein and transmission therethrough of light incident upon one of said layer surfaces responsive respectively to first and second magnitudes of an electric field formed through a portion of said layer;

four planes each having at least one substantially transparent electrode therein, each electrode being insulated from the remainder of said electrodes, each of said electrode planes being arranged substantially parallel to each other and to said surfaces of said liquid crystal layer, with first and second planes of electrodes being sequentially positioned outwardly adjacent to said first surface of said liquid crystal layer, with said second electrode plane between

said first electrode plane and said first liquid crystal layer surface, and third and fourth planes of electrodes being sequentially positioned outwardly adjacent to the second liquid crystal layer surface, with said third electrode plane between said liquid crystal layer second surface and said fourth electrode plane;

a layer of insulating material positioned at least between the electrodes of each pair of electrode planes positioned outwardly adjacent to each of said first and second surfaces of said liquid crystal layer; and

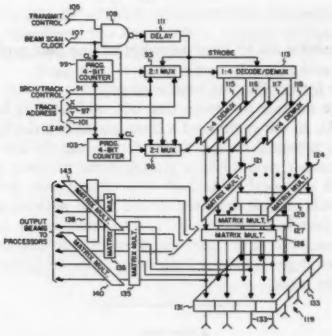
means for independently coupling selected ones of a plurality of driving waveforms to each of the electrodes of said four electrode planes to cause a portion of said liquid crystal material layer between any electrode adjacent to said first liquid crystal layer surface and any electrode adjacent to said liquid crystal layer to be switchable between a light-absorptive and a light-transmissive condition.

4,277,787

CHARGE TRANSFER DEVICE PHASED ARRAY BEAMSTEERING AND MULTIBEAM BEAMFORMER

Robert D. King, Clay, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,578
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—100 SA **8 Claims**



1. A radar system comprising:

(a) means for generating beamsteering phase weights comprising matrix multiplication means having a first plurality of real and imaginary signal inputs and a second plurality of real and imaginary signal outputs and operable to perform complex multiplication of signals applied to its real and imaginary signal inputs by a matrix of fixed coefficients to provide a plurality of summed product signals at its real and imaginary signal outputs, means for grounding said imaginary signal inputs, and means for selectively applying to at least one of said real signal inputs a sequence of pulses for matrix multiplication thereof such that for each input impulse there is developed a set of complex phase weights one pair of which appears at each pair of the real and imaginary outputs at a baseband frequency;

(b) a source of a radio frequency carrier wave and means for dividing said carrier wave into in-phase and quadrature components;

(c) a plurality of antenna elements disposed in an ordered array for generating one or more electromagnetic wave energy beams in directions determined by the wave energy phase gradient across the elements of the array;

(d) a like plurality of elemental transmitter means each connected to drive one of said antenna elements;

(e) modulator means including a first like plurality of means for modulating the in-phase components of said carrier wave by the baseband phase weights appearing at each of the real signal outputs of said phase weight generating means and a second plurality of means for modulating the quadrature components of said carrier wave by the baseband phase weights appearing at each of the imaginary signal outputs of said phase weight generating means, and

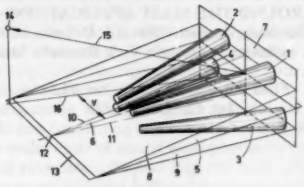
(f) means for combining the in-phase and quadrature signals thus modulated by each pair of signals from the real and imaginary signal outputs of the phase weight generating means to derive a set of phased transmitter excitation signals and for applying one thereof to each of said elemental transmitter means to thus produce across the antenna elements driven thereby a phase gradient such as to point the radiated beam in a desired direction.

4,277,788

DIRECTION DETERMINING APPARATUS RESPONSIVE TO ELECTROMAGNETIC RADIATION

Arne Törby, Linköping, Sweden, assignor to Saab-Scania AB, Linkoping, Sweden

Continuation-in-part of Ser. No. 954,304, Oct. 24, 1978, abandoned. This application Jul. 30, 1979, Ser. No. 61,894
Int. Cl.³ G01S *3/48;* **H01Q** *11/10*
U.S. Cl. 343—113 R **11 Claims**



1. Receiving apparatus responsive to electromagnetic radiations such as radar pulses, comprising an array of elongated end-firing log-periodic antenna elements defining a reference plane containing a sighting line, and signal processing apparatus connected with said array and comprising angle value indicating means, by which signals produced at the array by radiation emanating from a source that is forwardly remote from the array are processed to provide at said indicating means an indication of a directional angle between said sighting line and the projection upon said reference plane of a line through said array and said source, said receiving apparatus being characterized by:

A. said antenna array comprising two pairs of antenna elements,

(1) said pairs of antenna elements being disposed at opposite sides of the reference plane, in a substantially symmetrical relation thereto, and

(2)the two antenna elements of each pair being forwardly convergent relative to one another; and

B. said signal processing apparatus comprising

(1) first directional angle output producing means connected with two of said antenna elements for producing, in response to radiation that is intercepted by said two antenna elements, a first directional angle output having a magnitude which signifies any of one set of directional angles, of which only one corresponds to the true directional angle to the source of the intercepted radiation,

(2) second directional angle output producing means connected with the other two of said antenna elements for producing, in response to said radiation, a second directional angle output having a magnitude which signifies any of a second set of directional angles, of which only one corresponds to said true directional angle,

(3) third output producing means connected with said first and second directional angle output producing means for producing a third output having a magnitude corresponding to a function of a comparison relationship

between said first and said second directional angle outputs, and

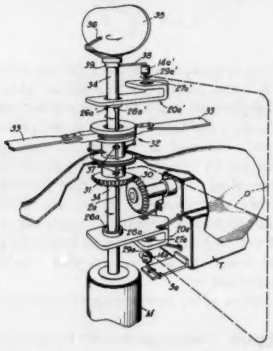
(4) comparison means connected with said first, said second and said third output producing means and comprising gating means, said comparison means being arranged to pass one of said directional angle outputs to said indicating means upon the condition that there is a predetermined relationship between said third output and at least the other of said directional angle outputs.

4,277,789

MICROWAVE ENERGY TRANSMISSION SYSTEM FOR AROUND-THE-MAST APPLICATIONS

Robert M. Goodman, Jr., and William J. Dittman, both of Marietta, Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Jul. 27, 1979, Ser. No. 61,511
Int. Cl.[3] H01Q *1/28*
U.S. Cl. 343—708 13 Claims



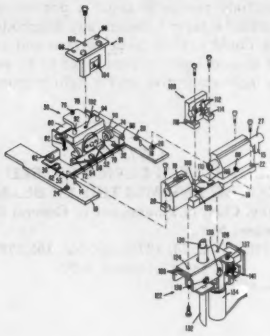
1. In a microwave energy transmission system including a member rotatable about a given axis and a first transmission line section carried by and rotatable with said member, and a further transmission line section which is stationary with respect to said member, the improvement comprising means for coupling said transmission line sections to transmit high power microwave energy without producing "wow"; said means comprising a first horn carried by said first section and having a flared aperture sweeping an arcuate path centered about said given axis, a second horn rotatably connected to said further section about a second axis non-coincident with said given axis and having a flared aperture adapted to sweep a sectored path centered about said second axis, and transition means for establishing a plurality of identical length transmission paths having opposite ends in spaced registry with corresponding equidistantly spaced circumferential points of said arcuate paths swept by said first and second horns; and means for causing said horns to sweep such corresponding points in synchronous fashion, the flared aperture of each horn being dimensioned to span a plurality of said points at any instant.

4,277,790

FIELD REPLACEABLE MODULES FOR INK JET HEAD ASSEMBLY

Harry P. Heibein, Longmont, Colo.; Richard G. Millington, Charlotte, N.C.; John M. Salvadore, Boulder, Colo.; Dean J. Scott, Longmont, Colo., and Michael L. Sendelweck, Lafayette, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,225
Int. Cl.[3] G01D *15/18, 15/00*
U.S. Cl. 346—75 11 Claims



1. A modular ink jet head assembly having field replaceable modules, said assembly comprising:

a frame for holding the head assembly;

a nozzle module for projecting ink, said module having a nozzle, an ink cavity and a drop generating device;

a sensor mounted on said frame for sensing the ink stream, said sensor monitoring a sensing point in space through which a properly aimed ink drop should pass; and

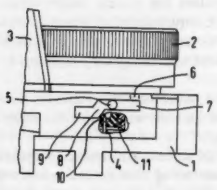
said nozzle module mounted on said frame with the nozzle a predetermined distance from the sensing point so that a reference line of predetermined length is defined along the desired flight path of the ink drops from the nozzle to the sensing point.

4,277,791

INK CONTROLLING DEVICE FOR INK PRINTING EQUIPMENT IN OFFICE MACHINES AND THE LIKE

Guenter Rosenstock, and Wilfried Kindler, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,379
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812562
Int. Cl.[3] G01D *15/16;* B41F *31/02*
U.S. Cl. 346—140 R 3 Claims



1. In a device for optionally shutting off the supply in an ink printing machine, with the ink being supplied to a printing head of the machine from a replaceable ink reservoir, in which device a hollow needle in the ink feed line to the printing head

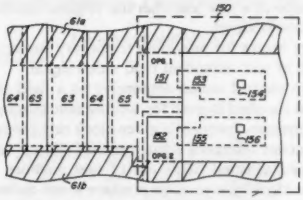
extends into the ink reservoir and is provided with an inlet aperture, the combination of the inlet aperture of the hollow needle extending at right angles to the direction of penetration of the hollow needle through the adjacent wall of the ink reservoir, which inlet aperture is smaller in diameter than the wall thickness at the point of penetration, an adjusting mechanism for permitting movement of the ink reservoir in the direction of penetration of the hollow needle through the reservoir wall between working and inoperative positions, said working position being where said inlet aperture is disposed within said ink reservoir above said adjacent ink reservoir wall and said inoperative position being where said inlet aperture is disposed in engagement with and sealed by the wall of the ink reservoir, wherein the ink reservoir is so disposed that it can rotate and pivot about the hollow needle, and said adjusting mechanism including a pin means fixably connected with the exterior surface of said ink reservoir and a slotted guide arrangement located in a wall member adjacent said ink reservoir exterior surface for cooperably receiving said pin, said slot arrangement provided with two end portions extending at right angles to the direction of movement of the reservoir, for respectively disposing the ink reservoir in said working and said inoperative positions and an intermediate guide portion connecting said two end portions for enabling adjustment of the ink reservoir to either of said two positions.

4,277,792

PIGGYBACK READOUT STRATIFIED CHANNEL CCD

Larry J. Hornbeck, Van Alstyne, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 17, 1978, Ser. No. 869,735
Int. Cl.³ H01L *29/78*; G11C *19/28*; H01L *27/14, 31/00*
U.S. Cl. 357—24 **15 Claims**



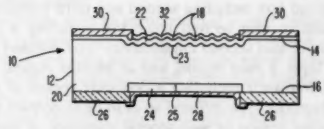
1. A charge coupled device comprised of:
(a) a semiconductor substrate having dopant atoms of a first conductivity type and a first surface;
(b) a charge transfer channel lying in said substrate near said first surface;
(c) an insulating layer lying over said charge transfer channel;
(d) a plurality of phase electrodes serially disposed on said insulating layer transversely to said charge transfer channel;
(e) a barrier region in said substrate lying under and adjacent to said charge transfer channel, said barrier region having dopant atoms of said first type;
(f) a charge integration channel in said substrate lying under and adjacent to said barrier region, said charge integration channel having dopant atoms of a second conductivity type opposite to said first type; and
(g) clocking means coupled to said electrodes for applying first voltages on selected ones of said electrodes to enable charge transfer from said charge integration channel to the portions of said charge transfer channel underlying said selected electrodes, and for applying second voltages on all of said electrodes to enable propagation of charge packets simultaneously along both said charge transfer channel and said charge integration channel in piggyback fashion to respective output ends of said channels.

4,277,793

PHOTODIODE HAVING ENHANCED LONG WAVELENGTH RESPONSE

Paul P. Webb, Beaconsfield, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Jul. 16, 1979, Ser. No. 58,026
Int. Cl.³ H01L *27/14, 29/12*
U.S. Cl. 357—30 **9 Claims**



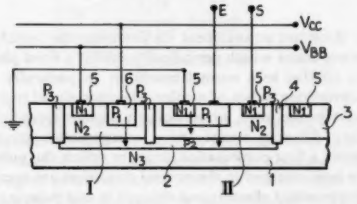
1. In a photodiode which comprises:
a semiconductor body having two opposed surfaces;
a first conducting region of a first conductivity type extending a distance into said body from a first surface of said body;
a second conducting region of a second conductivity type extending into said body from a second surface of said body, such that said regions of first and second conductivity type do not overlap;
first and second electrically conducting layers overlying portions of said first and second conducting regions, respectively, whereby electrical contact is made to said first and second conducting regions;
the improvement which comprises a portion of the surface of said first conducting region being contoured in the form of a regular array of almost hemispherically shaped indentations extending a distance into said body, wherein sharp points in the indented surface are directed away from the interior of the body, thereby minimizing the formation of local regions of high electric field in the interior of the body.

4,277,794

STRUCTURE FOR LOGIC CIRCUITS

Gerard Nuzillat, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 855,618, Nov. 29, 1977, abandoned.
This application Sep. 6, 1979, Ser. No. 72,841
Claims priority, application France, Dec. 3, 1976, 76 36534
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—40 **6 Claims**



1. An integrated logic circuit comprising:
a substrate layer of semiconductor material having a first conductivity type;
a first layer of semiconductor material of said first conductivity type epitaxied upon said substrate layer;
at least one second layer of semiconductor material inserted between said substrate layer and said first layer, said second layer being of a second conductivity type opposite to said first conductivity type;
walls of semiconductor material of said second type extending from the surface of said first layer of semiconductor

material through said second layer of semiconductor material so as to form therewith at least first and second insulating boxes;

said first box including semiconductor material regions forming a first bipolar transistor having an emitter region of said second conductivity type diffused into said first layer, a base region, a collector region, and contact means for coupling said collector and said base regions to power sources;

said second box including second and third complementary transistors, said second transistor including a collector region of said second conductivity type diffused into said first layer, a base region, and an emitter region, and said third transistor including a collector region of said first conductivity type diffused so as to be in contact with said collector region of said second transistor, a base region coinciding with said emitter region of said second transistor and an emitter region; and

contact input means coupled to said collector region of said second transistor and contact output means coupled to said collector region of said third transistor.

4,277,795

CIRCUIT ARRANGEMENT FOR DETECTING A SWITCHING PHASE

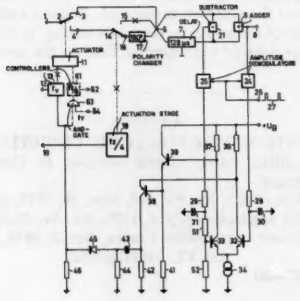
Karl H. Rehfeldt, Quickborn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1979, Ser. No. 55,947

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830168

Int. Cl.³ H04N *5/76, 9/47, 5/78*

U.S. Cl. 358—8 **7 Claims**



1. A circuit arrangement for detecting the switching phase of wave trains which periodically exhibit a fixed phase difference relative to a normal condition, in particular the color synchronizing pulses of a color television signal recorded on a video tape recorder, whose polarity changes from field to field, having delaying means and a compensation circuit which includes a first combination stage, in which the pulses, which have been restored to the normal condition, are combined, for example added, directly and delayed in said delaying means by a sampling interval, so that in the case of a correct switching rhythm, said first combination stage produces a signal having a maximum amplitude, characterized in that said circuit arrangement further comprises a second combination stage to which said direct and delayed signals are applied, a first and a second low-pass filter coupled respectively to said first and said second combination stage, and a comparator coupled to said first and said second low-pass filters, whereby in the event of an incorrect switching rhythm, said second combination stage produces a signal having a maximum amplitude while said first combination stage produces a signal having a minimum amplitude, causing said comparator to produce a correction signal.

4,277,796

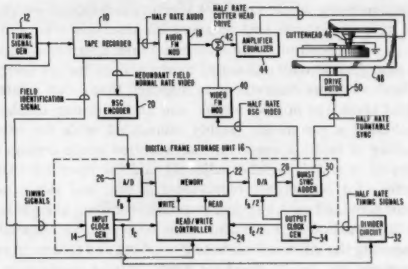
SLOW DOWN COLOR PROCESSOR FOR VIDEO DISC MASTERING USING A SPECIAL MODE VTR

Michael D. Ross, Somerdale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 22, 1979, Ser. No. 87,452

Int. Cl.³ H04N *5/795;* **G11B** *11/00, 19/28*

U.S. Cl. 358—8 **11 Claims**



1. A slow down processor for producing a composite audio-video signal of reduced bandwidth suitable for use in mastering of video disc records at less than real time rates, said processor comprising:

tape recorder means responsive in a playback mode for producing a redundant field video signal, each field being produced at a rate corresponding to the rate at which it was originally recorded on said tape, and responsive also in said playback mode for producing an audio signal from the tape at a rate less than the original recording rate of said audio signal;

memory means for providing temporary storage of selected fields of said redundant field video signal;

memory control means responsive to a field identification signal supplied thereto for writing said selected fields into said memory means at a given clock rate proportional to a subcarrier reference signal supplied thereto and for reading and selected fields out of said memory means at a lesser clock rate so as to produce a non-redundant video output signal of reduced bandwidth, the ratio of said clock rates being predetermined in accordance with the redundancy level of said redundant field video signal; and

means for combining said audio signal with said non-redundant video signal produced by said memory means to provide said composite signal.

4,277,797

COLOR TELEVISION RECEIVER HAVING AN AUTOMATIC ADJUSTMENT SYSTEM AND A PROCESS FOR ADJUSTING THE RECEIVER

Rainer Dangschat, Landsham; Alfred Jeschke, Munich; Helmüt Leichtl, Mittenwald, and Wolfgang Winkler, Egmating, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,346

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—21 R **13 Claims**

1. A color television receiver comprising:

receiving means for receiving television signals and providing video signals;

a picture tube including a picture screen;

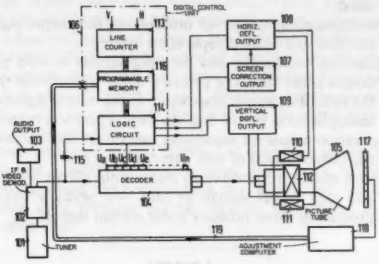
analog control stages coupled to said picture tube for controlling horizontal and vertical deflection and screen correction; and

a digital control unit connected to said receiving means and to said analog control stages for controlling the operation

of said control stages in accordance with the received video signal, said digital control unit including

a line counter for counting vertical and horizontal lines,

a programmable read only memory for storing reference values, and



logic means connected to said line counter and to said programmable read only memory, said logic means coupled to receive the video signals and connected to and operable to control said analog control stages in response to the video signals and the reference value stored in said memory.

4,277,798

AUTOMATIC KINESCOPE BIASING SYSTEM WITH INCREASED INTERFERENCE IMMUNITY

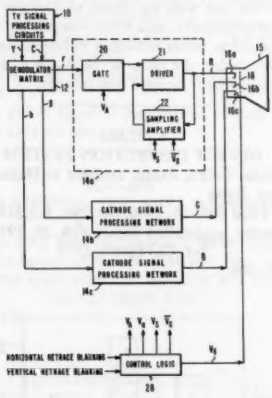
Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,656

Claims priority, application United Kingdom, Apr. 18, 1979, 13423/79

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—33 **11 Claims**



1. In a system for processing an image representative video signal having periodically recurring image display intervals and image blanking intervals during which image information to be displayed is absent, said system including an image display kinescope having an electron gun with cathode and grid intensity control electrodes; means for coupling video signals to said kinescope electron gun; and apparatus for automatically controlling the level of blanking current conducted by said kinescope, comprising:

means for providing a reference bias voltage to said cathode electrode via a cathode current conduction path during a monitoring interval when said blanking current conduction of said kinescope is to be monitored, said monitoring interval encompassing a portion of said blanking interval;

means for providing an auxiliary signal to said grid electrode with a sense for forward biasing said grid electrode during one portion of said monitoring interval;

first means with an input coupled to said cathode current path and operative during said one portion of said monitoring interval for deriving a first signal proportional to the level of cathode current conducted in response to said auxiliary signal;

second means with an input coupled to said cathode current path and operative during another portion of said monitoring interval for deriving a second signal proportional to the level of cathode current conducted during said other portion of said monitoring interval;

differential amplifier means responsive to said first and second derived signals for providing an output control signal proportional to the difference in magnitude between said first and second derived signals, and thereby proportional to the difference between currents flowing in said cathode current path over said monitoring interval; and

means for supplying said control signal to said video signal coupling means to modify the bias of said kinescope in a direction to adjust said signal difference to a level corresponding to a desired kinescope bias condition.

4,277,799

COLOR SOLID-STATE IMAGING DEVICE

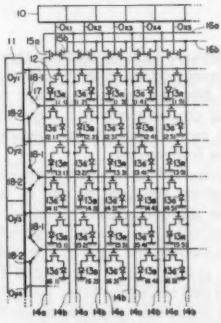
Norio Koike, Tokyo; Iwao Takemoto, Kodaira; Masaharu Kubo, Hachioji; Kazuhiro Sato, Tokyo, and Shusaku Nagahara, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 12, 1978, Ser. No. 923,982

Claims priority, application Japan, Jul. 13, 1977, 52-82965

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—44 **12 Claims**



11. A color solid-state imaging devices comprising;

a photoelectric conversion arrangement having a two-dimensional structure in which a first set of a plurality of photoelectric conversion elements for detecting respective lights of a plurality of different colors which set of conversion elements and their associated colors are regularly arranged in a certain order in a horizontal scanning direction, and a second set of a plurality of photoelectric conversion elements for detecting respective light of said colors which second set of conversion elements and their associated colors are regularly arranged in a certain order different from said first set in a horizontal scanning direction, with each of said sets being arranged alternately in a vertical scanning direction,

vertical switch means, disposed in correspondence with said photoelectric conversion elements arranged in two dimensions, for selecting said photoelectric conversion elements in response to vertical scanning pulses supplied thereto,

outputs of said vertical switch means being connected to respective vertical signal output lines provided in common for each of said colors, said vertical scanning pulses being supplied from vertical scanning circuit means for effecting interlaced scanning for reading out every two rows in the vertical scanning direction on the basis of combinations different for respective scanning fields,

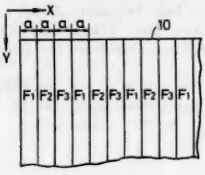
horizontal switches, disposed for the respective colors, turned "on" and "off" in response to horizontal scanning pulses supplied thereto

output means for deriving photoelectric conversion output signals through said horizontal switches disposed for said respective colors from said vertical signal output lines.

4,277,800
COLOR TELEVISION SIGNAL GENERATING APPARATUS

Shintaro Nakagaki; Itsuo Takanashi, both of Yokohama; Koichiro Motoyama, Ninomiya; Tadayoshi Miyoshi; Sumio Yokokawa, both of Yokohama, and Kenichi Miyazaki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 11, 1980, Ser. No. 129,337
Claims priority, application Japan, Mar. 12, 1979, 54-28450
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 **7 Claims**



1. A color television signal generating apparatus comprising:

a color-resolving striped filter comprising a plurality of groups of filter stripes, said groups being disposed in parallel and consecutively in a sequentially repeated arrangement, each of said groups comprising at least three filter stripes from among,

a first filter stripe having a light transmission characteristics for transmitting the light of one of the three primary colors of an addition mixture color,

a second filter stripe having a light transmission characteristic for transmitting the light of a mixed color which includes the primary color transmitted through said first filter stripe and one of the other two primary colors, and

a transparent third filter stripe for transmitting white light, said at least three filter stripes being arranged in parallel and consecutively in a specific sequence;

a camera tube having said color-resolving striped filter disposed on the front surface thereof and producing a superimposed output signal comprising, in superimposition:

a direct wave signal containing signals of the three primary colors in said addition mixture color, and

a high-band signal component comprising a group of modulated color signals resulting from an amplitude modulation of a carrier wave by the signals of two primary colors other than the primary color of the light transmitted through said first filter stripe, said carrier wave having a frequency equal to a space frequency determined by the number of said groups of filter stripes, and said carrier wave also having frequency components which are higher harmonics of the frequency of said carrier wave;

a first separation means for separating and deriving, out of the output signal of the camera tube, a fundamental wave component signal in which the carrier wave having the frequency equal to the space frequency is amplitude modulated;

a second separation means for separating and deriving, out of the output signal of the camera tube, a second harmonics wave component signal in which a carrier wave having a frequency twice the space frequency is amplitude modulated;

a multiplication means for multiplying the output signals of the first and second separation means;

means for separating and deriving signals of two primary colors other than the primary color transmitted through the first filter stripe, responsive to the output signals of the multiplication means and the first separation means;

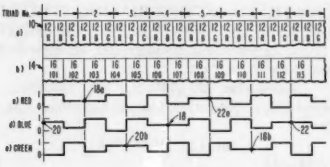
separation means for separating said direct wave signal from the output signal of said camera tube; and

matrix means, responsive to said output direct wave signal and said output signals of said two primary colors, for producing three primary color output signals.

4,277,801
COLOR FILTER HAVING VERTICAL COLOR STRIPES WITH A NONINTEGRAL RELATIONSHIP TO CCD PHOTOSENSORS

Roland N. Rhodes, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,301
Int. Cl.³ H04N 9/07
U.S. Cl. 358—55 **9 Claims**

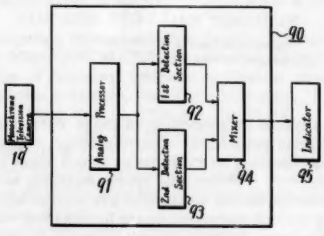


1. A filter for use with an image pickup device having a plurality of photosensors, said filter comprising a plurality of vertical stripe color filters arranged in horizontally repeating cycles of color order, the ratio of the width of a cycle to the width of a photosensor being a non-integer.

4,277,802
DEFECT INSPECTION SYSTEM

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries, Ltd., Tokyo, Japan

Filed Feb. 14, 1980, Ser. No. 121,518
Claims priority, application Japan, Feb. 20, 1979, 54-18867
Int. Cl.³ H04N 7/18
U.S. Cl. 358—106 **4 Claims**

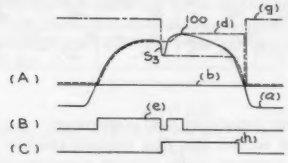


1. A defect inspection system by comparative inspection of a standard subject with an object to be inspected comprising:

(a) means for supporting a standard subject and an object to be inspected at predetermined positions, respectively;

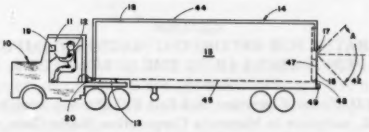
(b) optical means for forming an overlapped image of said standard image and object;
(c) means for picking up said overlapped image and producing a video signal thereof;
(d) a plurality of detecting means connected to said picking-up means for producing signals in response to rate of change of said video signal with respect to time, the sensitivity of said plurality of detecting means being so selected that when said standard subject and object coincide with each other, all of said plurality of detecting means produce signals, but when said object is different from said standard subject, some of said detecting means do not produce any signals while the remaining detecting means produce signals; and
(e) means connected to said plurality of detecting means for producing a defect detection signal when some of said detecting means do not produce any signals but the remaining ones produce signals, namely said object is a defective one.

4,277,803
AUTOMATIC PRODUCT CHECKING SYSTEM
Yasukazu Sano, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Tokyo, Japan
Filed May 12, 1980, Ser. No. 149,261
Int. Cl.³ H04N 7/18
U.S. Cl. 358—106 **10 Claims**



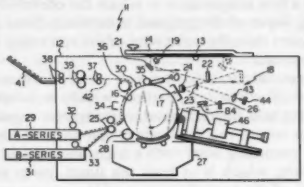
1. The method for checking the surface condition of a product which method includes the following steps:
generating a video signal representing at least a portion of the surface of the product;
counting the number of zero-slope conditions in said video signal; and,
generating a defect signal if the number of such zero-slope conditions exceeds one.

4,277,804
SYSTEM FOR VIEWING THE AREA REARWARDLY OF A VEHICLE
Elburn Robison, P.O. Box 788, Shawnee, Okla. 74801
Continuation-in-part of Ser. No. 956,695, Nov. 1, 1978, abandoned. This application Jan. 31, 1980, Ser. No. 117,174
Int. Cl.³ H04N 7/18
U.S. Cl. 358—108 **10 Claims**



1. In a viewing system for observing the area rearward of an automotive vehicle having a cabin area forward of an enclosed cargo section, a substantially flat panel adjacent the rear end of said cargo section, said panel being substantially vertically disposed and perpendicular to the longitudinal axis of said vehicle, and a television circuit comprising a camera positioned at the rear of said vehicle and connected by electrical wires to a display device positioned within said cabin area, the improved features comprising:
(a) a camera assembly comprising a television camera body and associated lens housed within a protective enclosure having a first transparent window optically aligned with said lens,
(b) said protective enclosure being mounted to an inside surface of said panel in a manner such that the axis of said lens lies horizontally in a plane perpendicular to the longitudinal axis of said vehicle,
(c) light deflecting means positioned in front of said lens to cause light coming from behind the vehicle to bend 90 degrees to enter said lens, and further causing left-to-right reversal of the image entering said lens, and
(d) an aperture within said panel admitting light onto said light deflecting means and positioned at a location between 20% and 70% of the total height of said vehicle.

4,277,805
COMBINATION COPYING-FACSIMILE REPRODUCTION APPARATUS
Yojiro Sato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Dec. 8, 1978, Ser. No. 967,835
Claims priority, application Japan, Dec. 27, 1977, 52-159717
Int. Cl.³ H04N 1/42
U.S. Cl. 358—286 **6 Claims**



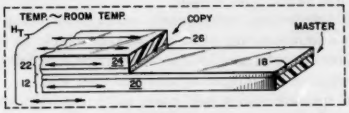
1. A reproduction apparatus including a moving photoconductive member and optical imaging means for radiating a light image of an original document onto the photoconductive member to form an electrostatic image of the document on the photoconductive member, characterized by comprising:
electronic scanning means for producing electrical signals corresponding to the document;
electronic imaging means for radiating a light image onto the photoconductive member corresponding to electrical signals applied to the electronic imaging means;
contour compensation means; and
control means for connecting an output of the electronic scanning means to an input of the contour compensation means and an output of the contour compensation means to an input of the electronic imaging means, the optical imaging means, electronic scanning means, contour compensation means and electronic imaging means being so constructed that an electrostatic image of the document formed on the photoconductive member by the electronic imaging means is superimposed on the electrostatic image of the document formed on the photoconductive member by optical imaging means;
the optical imaging means being constructed to radiate a light image of the document onto the electronic scanning means;
the optical imaging means comprising optical means for focussing a light image of a linear portion of the document onto the photoconductive member and the electronic scanning means and feed means for producing relative movement between the optical means and the document in a direction perpendicular to the linear portion of the document.

4,277,806

MAGNETIC RECORDING USING RECORDING MEDIA HAVING TEMPERATURE DEPENDENT COERCIVITY

Frederick J. Jeffers, Escondido, and Richard J. McClure, San Diego, both of Calif., assignors to Eastman Technology, Inc., Rochester, N.Y.

Filed May 14, 1979, Ser. No. 39,019
Int. Cl.[3] G11B *5/86*
U.S. Cl. 360—16 **15 Claims**



1. A duplicate magnetic record having magnetic signals recorded thereon corresponding to the magnetic signals previously recorded on the magnetic layer of an original magnetic record, said duplicate magnetic record being produced by the process of:

(a) anhysteretically transferring magnetic signals from the original magnetic record to a master record having a magnetic recording layer comprising submicron particles of MnBi dispersed in a binder, whereby an inverted mirror image of said magnetic signals is formed on the recording layer of said master, said anhysteretic transfer being effected at a first temperature at which the coercivity of the recording layer of the original is between three and ten times greater than the coercivity of the recording layer of the master; and

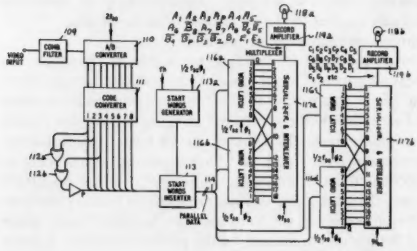
(b) anhysteretically transferring, at a second temperature of the order of room temperature which is substantially higher than said first temperature, magnetic signals from the master record to a duplicate magnetic record having a magnetic recording layer with a coercivity, at said second temperature, which is at least ten times lower than the coercivity of the recording layer of the master record.

4,277,807

RECORDING DIGITAL SIGNALS

John L. E. Baldwin, Croydon, England, assignor to Independent Broadcasting Authority, London, England

Continuation of Ser. No. 864,002, Dec. 23, 1977. This application Jun. 7, 1979, Ser. No. 46,267
Int. Cl.[3] G11B *5/00*; H04N *5/78*; G11B *5/09*
U.S. Cl. 360—32 **18 Claims**



1. The method for recording an alternating current analog signal in a manner to alleviate drop-outs, said signal having a given subcarrier frequeny (f_{SC}), comprising the steps of

(a) sampling the analog signal at a sampling frequency which is a multiple of the subcarrier frequency (f_{SC}), thereby to produce a plurality of digital words constituted by a plurality of bits;

(b) introducing into said digital words an error detection signal (P);

(c) storing groups of said digital words in at least two separate channels, respectively, a first group of words of one channel including first and second subgroups of words of different phase relative to each other, and a second group of words of the other channel including third and fourth subgroups of words of different phase relative to each other;

(d) serializing the subgroups of words of each channel, respectively; and

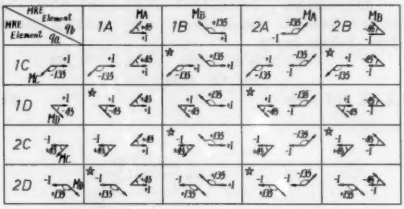
(e) recording on a recording medium the serialized channel signals, respectively.

4,277,808

MAGNETIC TRANSDUCER HEAD

Takehiro Nagaki, Komae, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 22, 1979, Ser. No. 41,439
Claims priority, application Japan, May 26, 1978, 53-62956
Int. Cl.[3] G11B *5/30, 5/12*
U.S. Cl. 360—113 **16 Claims**



1. A magnetic transducer head comprising:

(a) first and second thin film magneto-resistive elements having a common center tap and adjacently aligned on substantially one line;

(b) current supply means for flowing a current through said first and second magneto-resistive elements in respective selected directions; and

(c) bias means for applying a respective bias magnetic field to each of said first and second magneto-resistive elements, each of said bias magnetic fields being selected from a group of bias magnetic fields having respective directions of approximately $\pm(\pi/4)\pm(n/2)\,\pi$ (n being an integer) with respect to the direction of the current flowing through said first and second magneto-resistive elements;

said current supply means and said bias means being selected such that when a uniform signal magnetic field is applied to said first and second magneto-resistive elements, the resistances thereof are varied oppositely with respect to each other, whereby the outputs of said first and second magneto-resistive elements are tapped differentially for forming an output signal for said transducer head.

4,277,809

APPARATUS FOR RECORDING MAGNETIC IMPULSES PERPENDICULAR TO THE SURFACE OF A RECORDING MEDIUM

Robert D. Fisher, Cupertino, and Eric R. Katz, San Jose, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

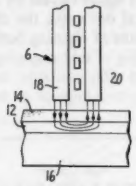
Filed Sep. 26, 1979, Ser. No. 78,876
Int. Cl.[3] G11B *5/66, 5/02*
U.S. Cl. 360—131 **9 Claims**

1. In apparatus for recording magnetic impulses on a selectively magnetizable medium, which apparatus includes a recording medium, at least one magnetic recording and playback head, means for moving the recording medium relative to the recording head and means for supplying signals to the record-

ing head for recording upon the medium, the improvement comprising

said recording medium comprising an extended under layer of a material having a magnetic permeability greater than 100, with an overlying coating of magnetic material having uniaxial anisotropy substantially perpendicular to the surface of said under layer, and

said magnetic recording and playback head being a unitary recording/playback head having two closely spaced magnetic poles with both said poles positioned adjacent the outer surface



of said recording medium overlying coating on one side of said medium, whereby the magnetic lines of flux extending between the poles of the head loop into and out of the outer surface of the recording medium overlying coating with the under layer of the recording medium causing the lines of flux to pass through the coating in a direction generally perpendicular to the surface of the medium to record information on the recording medium in the form of magnetic impulses having their axes of magnetization substantially perpendicular to the surface of the medium.

4,277,810

FLOPPY DISC STRUCTURE WITH RECTANGULAR CASING

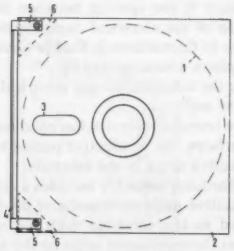
Hans Helmrich, Geisenbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,381

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 7808788[U]

Int. Cl.³ G11B *23/02, 25/04*

U.S. Cl. 360—133 **4 Claims**



1. A floppy disc structure to be gripped by a pair of spaced grippers of a gripping arrangement of a floppy disc drive unit for drawing the floppy disc structure into the floppy disc drive unit, comprising:

a rectangular casing for loading into a floppy disc drive unit, said casing including a pair of spaced walls;

a floppy disc rotatably mounted in said casing between said pair of spaced walls; and

spacing means between said walls only at gripping locations of the spaced grippers of the gripping arrangement at two adjacent corners of said casing and outside of the space occupied by said floppy disc, said spacing means having a thickness which is approximately the same as that of said floppy disc.

4,277,811

STATIC TYPE CIRCUIT BREAKER

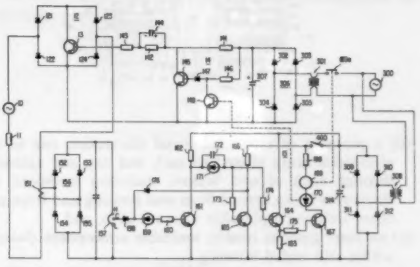
Kozo Sato, Hino, Japan, assignor to Tokyo Shibaura Electric Company, Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 771,329, Feb. 23, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,706

Claims priority, application Japan, Feb. 23, 1976, 51-18021; Feb. 23, 1976, 51-18029

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—101 **10 Claims**



1. In a load circuit containing a power source and a load, a static type circuit breaker comprising:

a first transistor adapted to be connected in series in the load circuit with the power source and the load;

a detector adapted to be connected to the load circuit for detecting a fault current flowing in the load circuit, the detector including

a second transistor;

a third transistor;

a first constant voltage diode connected to the base of the second transistor and conductive when a fault current flows through the load;

a parallel circuit, consisting of a second constant voltage diode in parallel with a condenser, connected to the collector of the second transistor and to the base of the third transistor;

a diode having its cathode connected to the base of the second transistor and its anode connected to the collector of the third transistor to form a self-maintaining circuit for the second transistor;

means for connecting the collector of the second transistor to a control power source;

means for connecting the collector of the third transistor to the control power source;

whereby when a fault current has flowed, the second transistor is made conductive and is made self-maintaining and the third transistor is made non-conductive to produce a fault voltage detection signal; and

means responsive to the producing of the detection signal for cutting off the base current of the first transistor to render the first transistor non-conductive.

4,277,812

EXCESS VOLTAGE ARRESTER

Raymond D. Jones, Cheam, England, assignor to TII Industries, Inc., Copiague, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,038

Int. Cl.³ H02H *3/22*

U.S. Cl. 361—119 **17 Claims**

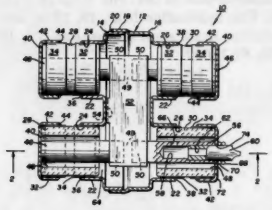
1. A gas-filled excess voltage arrester for preventing electrical surges, comprising:

(a) a sealed housing having a plurality of non-coaxially aligned openings therein;

(b) a plurality of elongated hollow insulating members, said

insulating members being provided with metalized bands proximate both ends thereof, one end of each said insulating members cooperating with each said housing opening and in sealed engagement therein;

(c) a plurality of metal end caps, said end caps being shaped to receive and be in sealed engagement with said insulating members;



(d) a plurality of elongated metal electrodes, one of said electrodes being affixed to each end cap and extending through each of said hollow insulating members, said electrodes being spaced from said housing and from each other, defining a plurality of spark gaps; and

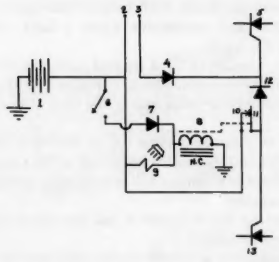
(e) an inert gaseous readily ionizable atmosphere disposed within said sealed housing.

4,277,813

ENVIRONMENTAL SIGNAL SWITCH FOR MOTOR VEHICLES

Paul A. Reneau, 9261 N. 60th St., Brown Deer, Wis. 53223

Filed Jul. 27, 1979, Ser. No. 61,384
Int. Cl.³ H01H *47/24*
U.S. Cl. 361—173 **4 Claims**



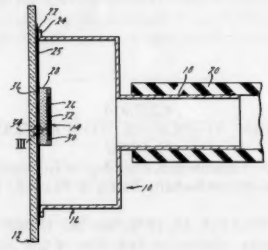
1. I claim a switching device for automotive use for the purpose of providing electrical current for activating electrical devices in response to moisture and the absence of daylight, the combination comprising a storage battery, moisture probes, a photoconductive cell, a direct current relay with sets of normally closed contacts, two (2) signal circuits from said battery to said electrical devices, two (2) or more electrical devices for receiving said signals (electrical current) of said signal circuits, the first said signal circuit having said moisture probes in series between said battery and said first electrical device(s), the said probes forming a closed switch between said battery and said first electrical device(s) when bridged by moisture (a conductive medium) and closing said first signal circuit to said first electrical device(s), the opening of said closed moisture switch opening said first signal circuit, the said second signal circuit having sets of said normally closed relay contacts in series between said battery and said first and said second electrical devices, two (2) circuits for engaging said relay, the first said engaging circuit being from said battery directly to the coil of said relay and also having a switch in series between said battery and said relay coil, the closing of said switch closing said first engaging circuit, the said second engaging circuit for said relay being in parallel with said first engaging circuit and having said photoconductive cell connected in series between said battery and said relay coil, the said cell being normally conductive in response to daylight, the said closed switch (cell) closing said second engaging circuit for said relay, the engaging of said relay is by means of closing any of the said engaging circuits, the said engaging of said relay opening said sets of normally closed contacts, the opening of said relay contacts opening said second signal circuit to all said electrical devices, the closing of said first signal circuit by said means activating only said first electrical device(s), the closing of said second signal circuit is by means of opening both said relay engaging circuits, the said opening of said engaging circuits closing said sets of normally closed relay contacts, the said closing of said second signal circuit activating all of the said electrical devices.

4,277,814

SEMICONDUCTOR VARIABLE CAPACITANCE PRESSURE TRANSDUCER ASSEMBLY

Joseph M. Giachino, Farmington Hills; Russell J. Haeberle, Canton, and Joseph W. Crow, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 4, 1979, Ser. No. 72,503
Int. Cl.³ H01G *5/00*
U.S. Cl. 361—283 **7 Claims**



1. An improved variable capacitance pressure transducer assembly of the type which has a capacitive pressure transducer device comprising at least two spaced conductive plates subject to variation in the spacing between the plates, and resultant variation of the electrical capacitance between the plates, in response to fluctuations in fluid pressure acting on at least one of the plates, characterized by:

(a) a substrate, the substrate having electrically conductive strips thereon; and

(b) the pressure transducer device has conductive bumps on one of its surfaces, the conductive pumps being attached to the conductive strips of the substrate;

wherein the transducer assembly includes a cover surrounding the capacitive pressure transducer device, the cover being bonded to the substrate with a closed-path seal which crosses the conductive strips on the substrate without electrical contact to such conductive strips.

4,277,815

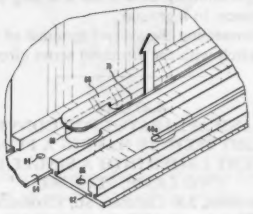
REPLACEABLE AIR SEAL FOR FORCE COOLED REMOVABLE ELECTRONIC UNITS

James D. Skroupa, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1979, Ser. No. 49,007
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—383 **5 Claims**

1. In an assembly removably containing aligned spaced board members mounted between opposed plate members forming a part of the assembly and said assembly having means

for indexed receipt of said board members providing a separation space between the board members, an aperture in each of said opposed plate members disposed to permit cooling air flow between selected adjacent spaced board members, and sealing means mounted on opposed facing surfaces of said plate members for sealingly engaging opposed facing surfaces of said selected adjacent boards to prevent the cooling air delivered to the separation space between the board members from leaking between the board members and said plate members, an improvement of each said sealing means comprising:



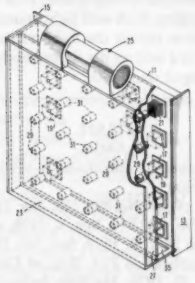
a planar strip slidingly retained on each said plate member, said strip having an aperture therethrough in alignment with said aperture in each said plate member and a resilient rubber-like seal ring bonded to each said strip and encircling said aperture in each said plate member and defining a peripheral surface having a dimension in the unbiased position generally larger than the spatial separation of said adjacent board members and deformable to a sealing engagement inherently biased against said board members within said assembly, and means for normally retaining each said strip in proper position on each said plate member.

4,277,816

ELECTRONIC CIRCUIT MODULE COOLING

Robert M. Dunn, Endicott; Martin D. Schulman, Wappingers, and Nicholas Timko, Jr., Johnson City, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1979, Ser. No. 43,404
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—384 **1 Claim**



1. A cooling apparatus combined with an electronic circuit assembly which includes a plurality of electronic cirucit modules mounted on a back mounting board assembly with the spaces between modules defining channels and the exposed surface of each module having a plurality of heat sink rods extending from said surface, said combination comprising:

an air plenum receiving cooling air at a relatively constant pressure, said plenum including a plurality of openings in one wall thereof, said number of openings being equal to the number of circuit modules on said board assembly and the pattern of said openings conforming approximately to the pattern of said circuit modules on said board assembly;

means mounting said plenum adjacent said board assembly with said openings facing toward the head sink rods and exposed surface of their associated modules; and

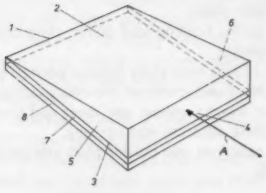
a plurality of hollow cylinders each having one end attached to an associated one of said openings and its opposite end disposed proximate to its associated module whereby a controled flow of air is caused to impinge in parallel down through said heat sink rods and onto the exposed surface of each of said modules, said air flow causing a turbulence within said heat sink rods to enhance the cooling of said modules with the spent air exhausting through the channels between the modules with minimum impingement on adjacent modules.

4,277,817

LARGE-AREA LIGHT SOURCE

Wilfried Hehr, Hildesheim-Himmelsthür, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jun. 13, 1979, Ser. No. 48,040
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, P 2827573
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—31 **4 Claims**



1. Large-area light source comprising

a light-transmissive body (**1**), a form of a thin wedge having an essentially flat, light-emitting surface and being of essentially rectangular cross section, adapted to be exposed to a visible radiation source at one side surface,

the wedge shaped light transmissive body has two major surfaces (**2,3**), which are inclined with respect to each other, one of said surface (**2**) forming the light-emitting surface.

the side surface (**4**) which receives the visible radiation (A) is a surface which is angled off from said one, or light-emitting surface (**2**) and joins said one light-emitting major surface (**2**) to the other major surface (**3**) at an essentially right-angle junction with respect to said other major surface (**3**),

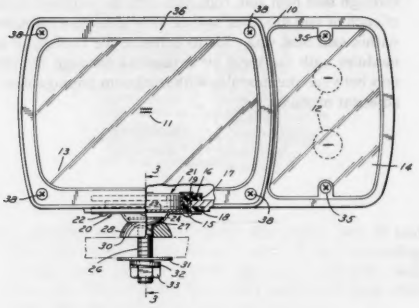
and a thin, light-transmissive layer (**7**) is provided coating said other major surface (**3**) opposite the light-emitting surface of the wedge-shaped body (**1**), the optical index of refraction of said layer (**7**) being less than the optical index of refraction of the material of the wedge-shaped body (**1**);

and a light-dispersing, light-reflecting pigment coating or layer (**8**) is provided, covering said light-transmissive coating or layer (**7**).

4,277,818
COMBINED HEADLIGHT, TURN SIGNAL AND PARKING LAMP FOR SNOW PLOWS AND THE LIKE

Karel Urbanek, Weston, and Arthur F. Bleiweiss, Toronto, both of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada

Filed Dec. 31, 1979, Ser. No. 108,967
Int. Cl.³ B60Q *3/00*; F21V *29/00*
U.S. Cl. 362—61 **20 Claims**

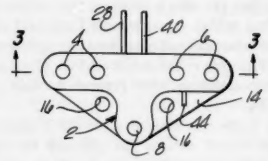


1. A lamp comprised of a housing and at least one bulb, said housing having an opening through one wall thereof,
a grommet of resilient material positioned in said opening,
said grommet having spaced radially outwardly extending flanges engaging the inner and outer surfaces of said housing adjacent said opening,
an outside plate engaging said outside flange of said grommet
an inside plate engaging said inside flange of said grommet
said inside plate having a portion formed outwardly toward said outside plate,
fastening means holding said inside plate and said outside plate together,
the height of said outwardly formed portion being less than the height of said grommet providing compression of said grommet flanges against said inner and outer surfaces of said housing adjacent said opening,
mounting means on said outside plate attaching said lamp to a vehicle.

4,277,819
BLACKOUT LIGHTING FOR VEHICLES

Valentine M. Sobota, Warren, and Marshall Vinson, East Detroit, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 3, 1979, Ser. No. 54,721
Int. Cl.³ B60Q *1/26*
U.S. Cl. 362—80 **6 Claims**

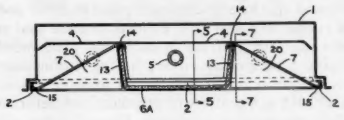


1. Blackout lighting for vehicles operating in wartime conditions, comprising:
(a.) a first pair of light emitting diodes connected in parallel,
(b.) a second pair of light emitting diodes connected in parallel,
(c.) a blocking diode,
(d.) a blackout marker operator-operable switch mounted accessible to the vehicle operator, having a first terminal connected with the vehicle battery and a second terminal, the switch being operable between a closed-circuit position and an open-circuit position,
(e.) a first resistance,
(f.) a series electrical circuit comprising the first and second pairs of light emitting diodes, the blocking diode, and the first resistance, to a ground,
(g.) means connecting the second terminal of said blackout marker switch with the aforesaid series circuit.

4,277,820
METHOD AND APPARATUS FOR CONVERTING A CEILING LIGHT FIXTURE HAVING A PLURALITY OF FLUORESCENT LAMPS INTO A SINGLE LAMP, OR TWO LAMP, FIXTURE

Edward T. Bostonian, 330 Christine St., Elizabeth, N.J. 07202

Filed Apr. 4, 1979, Ser. No. 27,076
Int. Cl.³ F21V *13/04*
U.S. Cl. 362—223 **18 Claims**



1. In a ceiling light fixture having a fixture body adapted for receiving a plurality of replaceable fluorescent lamps, and a light transmitting panel detachably supported by the fixture body for covering the fixture body, the improvement wherein said light transmitting panel includes a light transmitting part partially covering the fixture body and partially surrounding at least one of said fluorescent lamps for permitting light passage therefrom while leaving exposed a remaining portion of the fixture body at which a plurality of fluorescent lamps could have been installed, shielding means for covering said remaining portion of the fixture body; said shielding means being operatively positioned in facing relation to said light transmitting part to reflect downwardly light transmitted thereto, and door frame means detachably engageable with the fixture body and operatively engaging both said light transmitting part and said shielding means to mount the light transmitting part and the shielding means as a unit on the fixture body when the door frame means is engaged therewith.

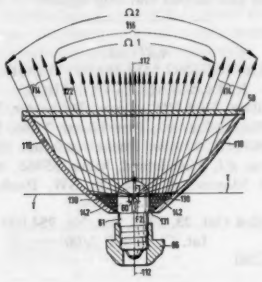
4,277,821
LAMP

Knut O. Sassmannshausen, Rothenbach, D-6580 Idar-Oberstein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 808,728, Jun. 21, 1977, Pat. No. 4,143,412, and Ser. No. 940,574, Sep. 8, 1978, abandoned. This application Mar. 9, 1979, Ser. No. 18,931
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628243; Oct. 22, 1976, 2647889; Ireland, Sep. 12, 1977, 1883/77
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—346 **42 Claims**

1. Lamp having a main concave and an assistant concave reflector disposed mutually coaxially and having different parameters and focal regions, the different focal regions being disposed in the common axis of the reflectors and spaced from one another, the lamp comprising a light source disposed in the focal region of the assistant reflector so that the main reflector emits a hollow conical light beam, the assistant reflector having a reflective surface formed with a multiplicity of reflecting

curved surface portions, the mean height of all thereof being equal to from 3% to 12% of the mean smallest base diameter of



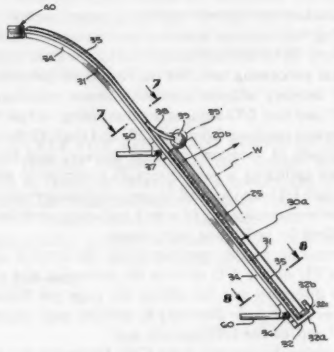
all of said reflecting curved surface portions for diverting light from the assistant reflector into a solidly conical light beam.

4,277,822

KNOCKDOWN SHADE ASSEMBLY FOR LIGHTING FIXTURE

Franz K. Weber, 15930 Royal Oak Rd., Encino, Calif. 91436, and Martin R. Reed, 323 N. Maple St., Burbank, Calif. 91505

Filed Jul. 5, 1979, Ser. No. 54,843
Int. Cl.³ F21V *1/06*
U.S. Cl. 362—352 **10 Claims**



1. In a lighting fixture, an easily disassembled shade assembly comprising, in combination:

a flat horizontally disposed base member having a central opening for receiving electrical circuit means extending vertically downward therethrough, and also having a plurality of recesses circumferentially spaced about its outer edge and extending radially inward therefrom;

a plurality of elongated ribs, one for each of said recesses, each rib having an inner end extending into the associated recess and releasably secured therein, the rib extending radially outward from said base member, bending downward through an angle of about 50°, and having a straight outer end portion;

a polygonal brace member having a number of straight sections equal to the number of said ribs, said brace member being horizontally disposed, positioned beneath said base member, and located inside the straight portions of said ribs with each apex of said brace member being releasably secured to the interior and underside of an associated one of said ribs; and

a plurality of flat trapezoidal windows, each of said windows being disposed between two adjacent ribs and each end of each window being aligned with the associated rib on the exterior side thereof;

said plurality of windows collectively forming a regular polyhedron surrounding the lower ends of said ribs;

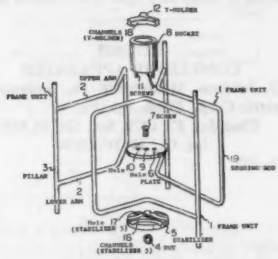
the vertical height of said windows being less than the vertical height of said ribs, thereby leaving a vertical open space above said windows and below said base member.

4,277,823

EASY-TO-ASSEMBLE LAMP

Akira Suzuki, Tokyo, Japan, assignor to Kazusuke Takagi, Tokyo, Japan, a part interest

Filed Jul. 10, 1979, Ser. No. 56,431
Claims priority, application Japan, Dec. 25, 1978, 53-177896[U]
Int. Cl.³ F21V *1/06*
U.S. Cl. 362—352 **11 Claims**



1. A lamp easily assembled and disassembled comprising:

a plurality of frame units each including a pillar extending vertically and first and second frame arms transversely extending from said pillar and joined to one another at their opposite ends by a vertically extending rod, each of said frame arms being bent at its intermediate portion, the bent portion of each of said frame units being disposed adjacent one another;

a lower holder attached to each of said first frame arms for clamping said frame units together;

an upper holder attached to each of said second frame arms;

a socket mounted on one of said upper and lower holders; and

a plurality of shade plates each with two opposite edge portions thereof curved so as to define facingly disposed channels, one of said channels receiving therein said pillar, the other of said channels receiving therein said rod so as to secure said shade plate to said frame unit.

4,277,824

START-UP CIRCUIT

Jade H. Alberkrack, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 12, 1979, Ser. No. 74,590
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—49 **7 Claims**

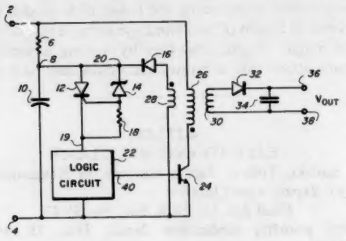
1. A start-up circuit having an AC line voltage applied across first and second terminals thereof for supplying power to a user circuit which in turn generates a pulse train at its output, comprising:

first means coupled between said first and second terminals for deriving a first DC voltage from said AC line voltage;

a silicon controlled rectifier having its anode coupled to said first means and having its cathode coupled to said user circuit for applying power thereto;

second means coupled to said silicon controlled rectifier and

responsive to said first DC voltage for turning said silicon controlled rectifier on; and



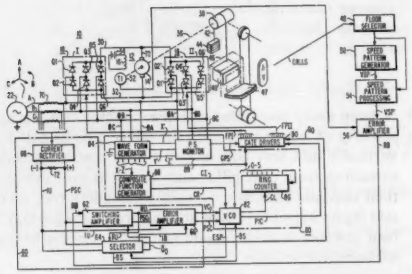
third means coupled between said output and said first means for maintaining a second DC voltage across said first means to latch said silicon controlled rectifier on.

4,277,825

CONVERTER APPARATUS

Frederick O. Johnson, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 27, 1979, Ser. No. 61,533
Int. Cl.³ H02P *13/24*
U.S. Cl. 363—87 **6 Claims**



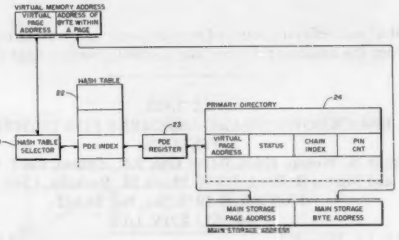
1. Converter apparatus, comprising:
a polyphase source of alternating potential,
a load circuit,
converter means having controlled rectifier devices connected to interchange electrical energy between said source of alternating potential and said load circuit,
means providing a feedback signal responsive to a predetermined parameter of said converter means,
means providing a reference signal indicative of the desired operation of said converter means,
means providing an error signal in response to said feedback and reference signals,
first means providing a first plurality of logic signals responsive to said polyphase source of alternating potential, with each of said logic signals being phase shifted by a predetermined angle from a selected voltage of said polyphase source,
second means sequentially providing a second plurality of logic signals, with each logic signal initiating the gating of a selected one of the controlled rectifier devices,
third means logically combining predetermined logic signals from the first and second plurality of logic signals to provide first and second end stop signals for each controlled rectifier device,
and phase controller means responsive to said error signal and to said first and second end stop signals, said phase controller means providing a signal for said second means which causes said second means to issue the next logic signal and gate the associated controlled rectifier device, as required by the error signal, but within the constraints of the first and second end stop signals.

4,277,826

SYNCHRONIZING MECHANISM FOR PAGE REPLACEMENT CONTROL

Robert W. Collins, 2404 NW. 4 Ave., Rochester, Minn. 55901; Roy L. Hoffman, Rte. #2, Pine Island, Minn. 55963; Larry W. Loen, 2203 NW. 17 Ave., Rochester, Minn. 55901; Glen R. Mitchell, Rte. #1, Pine Island, Minn. 55963, and Frank G. Soltis, 2804 Mayowood Hills Dr. SW, Rochester, Minn. 55901

Filed Oct. 23, 1978, Ser. No. 954,034
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **13 Claims**



1. In a computer system employing paged virtual memory and having main storage, a central processing unit (CPU), and input-output (I/O) devices connected to the main storage and the central processing unit, the improvement comprising:
virtual memory address translation means common to said CPU and said I/O devices for translating virtual memory addresses received from the CPU and the I/O devices into addresses of locations in main storage, said translation means including a page directory common to said CPU and said I/O devices and having entries corresponding to pages in main storage, in which said entry contains a page pin field for indicating page usage;
synchronizing means operable under the control of either the CPU or the I/O devices for accessing said common page directory and for setting the page pin fields in the entries of the page directory to indicate page usage by the CPU and/or the I/O devices; and
means under the control of the CPU for testing the page pin fields for indicating page usage to determine whether a given page is in use by either the CPU or the I/O devices and for invalidating further references to that page when it is found not to be in use, without surrendering control between the testing and invalidating operations.

4,277,827

MICROPROCESSOR BASED SYSTEM FOR THE DEVELOPMENT AND EMULATION OF PROGRAMMABLE CALCULATOR CONTROL READ ONLY MEMORY SOFTWARE

George M. Carlson, Sugarland, and Michael O'Hagan, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

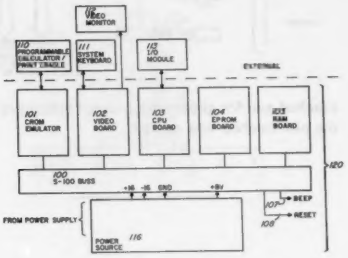
Filed Jan. 2, 1979, Ser. No. 615
Int. Cl.³ G06F *9/00, 15/02, 15/20*
U.S. Cl. 364—200 **13 Claims**

1. A system, used externally in conjunction with a programmable calculator containing an external control read only memory port and a control read only memory for generating instruction and clock signals, for emulating and developing control read only memory of said calculator, comprising:

(A) means for connection to an external control read only memory port of a programmable calculator for receiving said instruction and clock signals,

(B) means for emulating an external control read only memory for said calculator coupled to said means for connection said means for emulating comprising:

(1) interface controller means connectable to said port of said calculator for decoding instruction commands received from said calculator via said port for providing selected data via said port to said calculator for execution therein in response to said instruction commands; and



(2) memory means, coupled to said controller means for providing to said controller means prestored data corresponding to a control read only memory program, in a sequence addressed by said controller means, said controller means including means for decoding said data from said memory means and for transmitting said data to said calculator via said port, whereby said control read only memory of said programmable calculator is being replaced by the memory means.

4,277,828

ANALYZER FOR RESULTANT FORCE AT JOINT

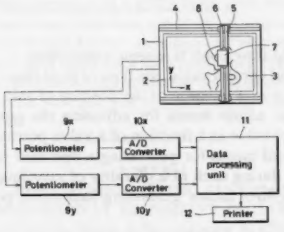
Tetsuya Tateishi, Higashi-Murayama, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Oct. 19, 1979, Ser. No. 86,687

Claims priority, application Japan, Oct. 24, 1978, 53-1300760

Int. Cl.³ A61B *5/00*

U.S. Cl. 364—415 **2 Claims**



1. An analyzer for the resultant force at a given joint in a human/animal body, which comprises:

a table provided with a transparent top plate and adapted to support thereon the image of the joint under test,

a pair of cursors disposed on the table, one adapted to be freely slid on the table in the longitudinal direction and the other adapted to be freely slid on the table in the lateral direction,

a pair of potentiometers adapted to generate potential signals corresponding to the positions assumed by the cursors on the table, and

a data processing unit adapted to calculate the resultant force at the joint in accordance with the potential signals issuing from the potentiometers and representing the crucial points of the image of the joint.

4,277,829

ERROR PREVENTING DEVICE FOR AN ELECTRONIC ENGINE CONTROL APPARATUS

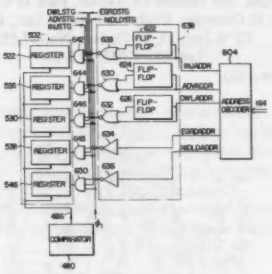
Hiroastu Tokuda, Katsuta; Shigeki Morinaga, Hitachi, and Hideo Nakamura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1978, Ser. No. 952,276

Claims priority, application Japan, Oct. 19, 1977, 52-125981

Int. Cl.³ G05B *15/02;* **G06F** *11/00;* **F02D** *5/00*

U.S. Cl. 364—431 **70 Claims**



43. For use in a processor-controlled apparatus for controlling the operation of an internal combustion engine having an output crankshaft driven by mechanical energy converted from heat energy which is released by the combustion of fuel, said engine including at least fuel supply means for supplying fuel to said engine and ignition means for controlling the ignition of fuel supplied to the engine in response to signals produced by sensors in accordance with operating conditions of the engine, said sensors including rotation sensor means for generating pulses in accordance with the rotation of said output crankshaft,

a control appartus comprising, in combination:

first means for generating an engine control timing signal pattern containing timing pulses occurring at predetermined intervals through which operational events of said engine are controlled;

second means for storing processor-generated engine control data;

third means, coupled to said first means, for generating respective engine timing codes the values of which are selectively modified by said engine control timing signal pattern;

fourth means, coupled to said second and third means, for comparing respective ones of said engine timing codes with respective engine control data and producing respective output signals when said respective engine timing codes define a prescribed relationship with respect to said engine control data; and

fifth means, coupled to said fourth means, for producing respective control signals to be supplied to said fuel supply means and said ignition control means in response to respective output signals produced by said fourth means, and wherein

said second means includes means for storing first prescribed engine control data representative of a prescribed angular rotation of said crankshaft between a predetermined angular position of said crankshaft and the angular position of said crankshaft at which said rotation sensor means produces a prescribed reference pulse, and

said fourth means includes means for producing an output signal for controlling the supply of fuel to said engine by said fuel supply means upon a first of said engine timing

codes generating by said third means reaching a value corresponding to said first prescribed engine control data; and

wherein said control apparatus further includes

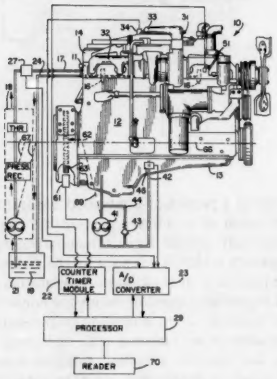
sixth means for preventing said fifth means from responding to an output signal produced by said fourth means, so that said fifth means does not supply a control signal at its output, during the coupling of respective engine control data to said second means.

4,277,830

DIAGNOSIS OF ENGINE TURBOCHARGER PERFORMANCE

David L. Reid, and Dennis O. Taylor, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 11, 1979, Ser. No. 47,055
Int. Cl.³ G01M *15/00*
U.S. Cl. 364—431 **7 Claims**



5. Apparatus for testing a turbocharger of an internal combustion engine, comprising speed sensor means responsive to engine speed, pressure sensor means responsive to intake manifold pressure, and processor means responsive to said speed and pressure for determining when said engine has stabilized at maximum governed speed after a period of rapid acceleration, and for taking first and second time spaced pressure measurements after said engine has stabilized but before said turbocharger has stabilized.

4,277,831

COMPUTER AIDED WIRE WRAP OPERATOR CHECK SYSTEM

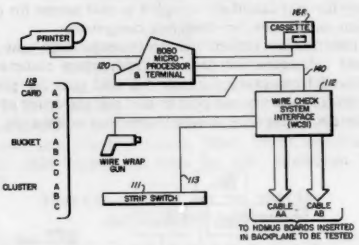
Robert C. Saunders; Dean T. Au; W. Ray Williams, and Donald Zurek, all of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed May 18, 1979, Ser. No. 40,249
Int. Cl.³ G01R *31/02*
U.S. Cl. 364—481 **10 Claims**

1. A wire wrap error check apparatus for verification of correct placement of a wire wrap tool on a wire wrap pin in an array of pins on a logic board comprising:

(a) a first means for supplying binary pin data indicating which pin in an array of pins is the correct pin for one operation in a particular wiring transaction and for supplying condition data indicating an expected electrical condition on the pin touched;

(b) a second means for decoding said binary pin data indicating the correct pin and for subjecting said correct pin to said predetermined electrical condition and for comparing the expected electrical condition derived from said condition data to the actual electrical condition on the pin



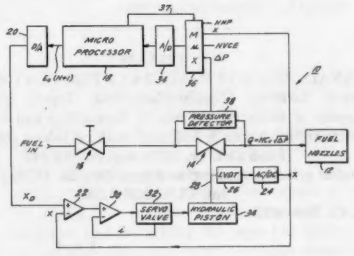
touched and for generating a signal indicative of whether the pin touched was correct.

4,277,832

FLUID FLOW CONTROL SYSTEM

Thomas Y. Wong, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,197
Int. Cl.³ G06F *15/20*; G01F *1/34*
U.S. Cl. 364—510 **21 Claims**



1. A fluid flow control system, comprising:

(A) a fluid control valve, the flow of fluid through said valve varying as a function of the position of said valve;

(B) valve adjust means for adjusting the position of said control valve as a function of a valve position signal; and

(C) control means for generating a new said valve position signal during each of a plurality of sampling intervals N, said control means generating said valve position signal by:

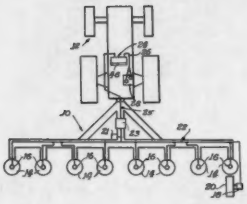
(1) computing, during each successive sampling interval N, the rate of flow of fluid through said valve as a function of the position of said valve and in accordance with the static flow equation for said valve; and

(2) generating said new valve position signal as a function of the difference between a desired flow and said computed flow and in accordance with a non-linear control transfer function which limits said valve position signal, and therefore limits the change in position of said valve between the present sampling interval N and the following sampling interval N+1, to a value which ensures that the actual flow of fluid through said valve during said following sampling interval N+1 is substantially equal to the flow predicted by said static flow equation.

4,277,833
PLANTER POPULATION MONITOR

David E. Steffen, Chatham, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Continuation-in-part of Ser. No. 939,605, Sep. 5, 1978, Pat. No. 4,225,930. This application Oct. 17, 1979, Ser. No. 85,743
Int. Cl.³ G06F *15/20;* G08B *21/00*
U.S. Cl. 364—555 13 Claims



1. A monitoring apparatus for monitoring a plurality of functions of a multi-row field seed planting machine including ground speed sensor means and including seed sensor means associated with each row of said multi-row seed planting machine, comprising: electronic circuit means, including a microprocessor operating in accordance with a predetermined program, for continually receiving and storing population data simultaneously from all of said plurality of seed sensor means and from said ground speed sensor means, user accessible control means coupled with said microprocessor and observable indicator means, the electronic circuit means further including means for energizing said observable indicator means for producing observable indications derived from the population data substantially immediately as such indications are called for by said user accessible control means and wherein said user accessible control means includes means for providing input data to said electronic circuit means representative of machine characteristics of a given multi-row field seed planting machine whose functions are to be monitored, said electronic circuit means further including an EAROM and means responsive to said input data for customizing the EAROM to customize said monitoring apparatus for operation with given multi-row field seed planting machine whose functions are to be monitored.

4,277,834
WAVE-SIGNAL-PROCESSING SYSTEM WITH A TWO-DIMENSIONAL RECURSIVE DIGITAL FILTER

Giovanni Garibotto, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

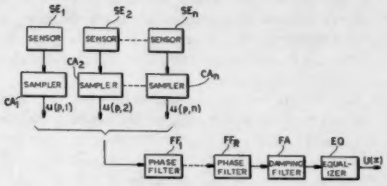
Continuation-in-part of Ser. No. 968,863, Dec. 12, 1978, abandoned. This application Jul. 6, 1979, Ser. No. 55,262
Claims priority, application Italy, Dec. 21, 1977, 69862 A/77
Int. Cl.³ G06F *15/31;* G01V *1/28*
U.S. Cl. 364—724 7 Claims

1. A processing system for determining the location of a shock-wave source in a homogeneous medium, comprising:

a multiplicity of equispaced sensors disposed in a generally linear array for detecting magnitudes of a wave field generated by said source;

sampling means operationally connected to said sensors for extracting pulses therefrom at successive sampling intervals equal to the quotient of the distance between juxtaposed sensors divided by the average wave velocity in said medium;

two-dimensional phase-shifting filter means operationally connected to said sampling means for generating during each sampling interval, from pulses extracted from said sensors, output signals approximating wave-field values at progressively increasing distances from said linear array;



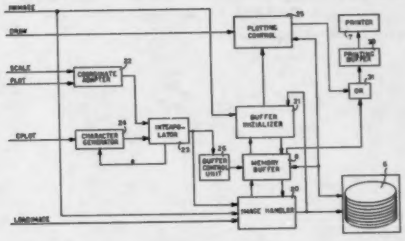
a two-dimensional attenuator operationally connected to said filter means for damping signals having a temporal frequency component less in magnitude than the product of an associated spatial frequency component multiplied by said wave velocity; and

a two-dimensional equalizer operationally connected to said attenuator for ensuring a global linear response thereof.

4,277,835
APPARATUS FOR RECORDING AND DISPLAYING OR PLOTTING GRAPHS

Gastone Garziera, Ivrea, and Federico Pisani, Scarmagno, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Mar. 3, 1978, Ser. No. 883,245
Claims priority, application Italy, Mar. 9, 1977, 67509 A/77
Int. Cl.³ G06F *3/12, 3/13*
U.S. Cl. 364—900 18 Claims



1. In a graphic recording and plotting system for recording and plotting graphs obtained as a computer output, wherein said plotted graph consists of a plotted area which is divided in subareas arranged in sequence, each subarea including a group of locations of points of said graph, and having a computer unit for sequentially generating the points of the graph, and a read-write operating memory for storing said graph, the improvement comprising a data compaction system comprising:

said memory being divided in cells, each one adapted to store a group of indications associated with the points of the graph included in a corresponding subarea,

said computing unit including an initialization means for recording in each cell a number indicating a corresponding plurality of adjacent blank subareas, whereby said cells store a compact record of said blank subareas,

means for plotting a graph stored by said memory,

addressable recording means controlled by said computing unit in response to the generation of each point of the graph for recording in an addressable cell of said memory an indication corresponding to the location of said gener-

ated point of the graph and an additional indication indicating that the selected cell records at least the indication of one of the associated point locations,

addressing means included in said computing unit responsive to said numbers recorded in said cells for addressing said recording means as to record, in the next memory cell following a series of cells indicating points of the graph, a number indicating the total number of blank subareas separating the location of the next point to be recorded from the previous recorded locations, whereby the locations of the various generated points are recorded in the same order as the representation of the points to be made by said plotting means,

shifting means included in said computing unit and conditioned by said addressing means when addressing said recording means at a cell recording at least one blank subarea for causing the shifting in said memory of the records of all cells following the addressed cell,

and reading means for sequentially reading the cells of said memory for controlling said plotting means.

4,277,836

COMPOSITE RANDOM ACCESS MEMORY PROVIDING DIRECT AND AUXILIARY MEMORY ACCESS

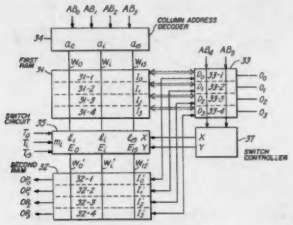
Yuichi Kawakami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 752,892, Dec. 21, 1976, abandoned. This application Aug. 18, 1978, Ser. No. 934,982

Claims priority, application Japan, Dec. 25, 1975, 50-152906

Int. Cl.[3] G06F *13/06;* G11C *11/40, 5/02*

U.S. Cl. 364—900 **5 Claims**



3. A memory device comprising a plurality of column lines, said column lines being divided into first and second column line parts, a plurality of first row lines intersecting said first column line part, a plurality of second row lines intersecting said second column line part, memory cells arranged at the intersections of said first and second column line parts and the row lines, a plurality of first data lines, a plurality of second data lines, means for selectively coupling selected row lines of said first and second row lines to said first data lines, means for coupling said second row lines to said second data lines, first selecting means for selecting said first column line parts, second selecting means for selecting said second column line parts, detecting means for detecting when said second row lines are coupled to said first data lines, and first gating means responsive to said detection means for inhibiting said second selecting means from selecting said second column line part when said second row lines are coupled to said first data lines.

4,277,837

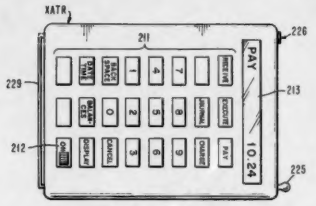
PERSONAL PORTABLE TERMINAL FOR FINANCIAL TRANSACTIONS

Paul E. Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 866,197, Dec. 30, 1977. This application Feb. 11, 1980, Ser. No. 120,225

Int. Cl.[3] G06F *15/16;* G06K *1/14, 17/00*

U.S. Cl. 364—900 **6 Claims**



1. A substantially wallet-sized personal portable hand held terminal device (XATR) including keyboard means for entering transaction data, memory means for at least temporarily storing transaction data and other selected data logic means for performing arithmetic operations on data stored in said memory means and data entered via said keyboard means, display means for selectively displaying data to the operator of said terminal device (XATR), control means for causing predetermined operations to be performed by said terminal device (XATR), means for receiving at least one data storage and transfer card (DSTC) in said terminal device (XATR), receiving and transmitting means located in said terminal device (XATR) for coupling with complementary data receiving an transmitting means in said data storage and transfer card (DSTC) for transferring data between said terminal device (XATR) and said data storage and transfer card (DSTC), means in said terminal device (XATR) for preventing the transfer of data to or from a said contained data storage and transfer card (DSTC) until actuated by the operator of said terminal device (XATR), fixed means for directly connecting said terminal device (XATR) to external devices, said external devices including receiving and transmitting means for transferring data between said external devices and said data storage and transfer card (DSTC) contained in said terminal device (XATR), whereby said terminal device (XATR) effectively functions as a controllable interface device between said at least one contained data storage and transfer card (DSTC) and said external devices, means responsive to the recognition of said external device as being a second substantially wallet-sized personal portable hand held terminal device (XATR), for concurrently entering data in said data storage and transfer card (DSTC) located in said first terminal device (XATR) and a data storage and transfer card (DSTC) located in said second connected terminal device (XATR), said last named means being responsive to the approval by both operators of said terminal device (XATRs) for entering data in said both data storage and transfer card (DSTCs) after the data is first displayed on said display means which approval is signified by said operators deactivating said means for preventing in said both terminal devices (XATRs).

4,277,838

DATA RECEIVING APPARATUS

John P. Chambers, Crawley, England, assignor to British Broadcasting Corporation, London, England

Filed May 4, 1979, Ser. No. 36,259

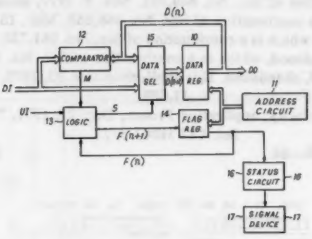
Claims priority, application United Kingdom, May 8, 1978, 18293/78

Int. Cl.[3] G11C *13/00*

U.S. Cl. 365—222 **4 Claims**

1. Data receiving apparatus comprising means for storing a

block of received bytes, means for storing at least one flag bit individual to each byte, and control means operable in each refresh cycle of the apparatus and on a byte-by-byte basis to compare the currently received byte with the currently stored corresponding byte, to subject the corresponding flag bit(s) to



a non-cyclic count operation of one sense when the compared bytes match and of the other sense when the compared bytes do not match, and to replace the stored byte by the received byte, when they do not match, conditionally in dependence upon the state of the corresponding flag bit(s) established in the preceding refresh cycle.

4,277,839

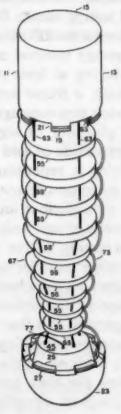
TRANSDUCER ARRAY RELEASE AND PRESSURE COMPENSATION SYSTEM

James A. McKinney, Fort Wayne, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1980, Ser. No. 121,550

Int. Cl.³ H04R *1/44*

U.S. Cl. 367—155 **13 Claims**



1. A transducer array release and pressure compensation system comprising in combination:

a cylindrical housing having a permanently closed upper end and an open lower end, the lower end of said cylindrical housing having a plurality of teeth, each of which has located therein a groove;

a nose cone assembly having an outlet port, and a plurality of teeth in interlocking removable engagement with the teeth of said cylindrical housing, each tooth of said nose cone assembly having a groove therein in substantial alignment with the grooves of the teeth of said cylindrical housing;

signal sending means positioned within said cylindrical housing, said signal sending means having a plurality of inlet ports effectively connected to the outlet port of said nose cone assembly for transmitting through a liquid a plurality of sound waves;

pressure compensating means located within said nose cone assembly and secured thereto for varying the air pressure within said signal sending means when hydrostatic pressure is applied to said pressure compensating means so as to prevent the fracturing of said signal sending means when hydrostatic pressure is applied thereto; and

securing means adapted to fit within the grooves of the teeth of said nose cone assembly and said cylindrical housing, and effectively connected to said pressure compensating means for releasing said nose cone assembly from said cylindrical housing when hydrostatic pressure is applied to said pressure compensating means.

4,277,840

ELECTRONIC TIMEPIECE

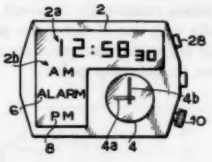
Fukuo Sekiya, Tokorozawa, and Takashi Yamada, Sayama, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1978, Ser. No. 965,892

Claims priority, application Japan, Dec. 27, 1977, 52-175181[U]

Int. Cl.³ G04B *25/00, 23/02;* G04C *9/00*

U.S. Cl. 368—71 **10 Claims**



1. An electronic timepiece comprising a first display unit including an electronic/optical means to display the present time in the form of digital values, and a second display unit for displaying the time maintained by an additional function, in which said second display unit is an analog display wherein

(a) the analog display is interconnected with the electronic-/optical display by means of an electronic circuit;

(b) the analog display becomes interlocked with the electronic interconnection circuit during the operation of the analog display;

(c) the analog display displays time in time units which are of the same magnitude as at least one of the time units displayed by the digital display; and

(d) an external operating means is operable in one mode to adjust both the analog and digital displays and operable in an alternate mode to adjust either the analog display or the digital display, thereby allowing synchronization of the analog and digital displays.

4,277,841

ELAPSED TIME INDICATOR

Gerald W. Ogden, Elgin, Ill., assignor to General Time Corporation, Thomaston, Conn.

Filed Mar. 14, 1979, Ser. No. 20,434

Int. Cl.³ G04B *19/20;* G04C *15/00;* H02H *37/17*

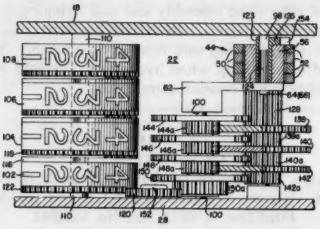
U.S. Cl. 368—78 **4 Claims**

1. A stepping motor for an elapsed time indicator comprising:

(a) a rotor having two magnetic poles of alternate opposite polarity in contiguous arrangement therearound;

(b) a stator having a single pair of stator poles, and a winding adapted to be energized by current pulses occurring periodically for polarizing said stator poles in opposite polarity to each other during substantially the duration of each said pulse, said stator poles being arranged to provide a radial air gap within which said rotor moves and each said

stator pole having a face along said air gap adjacent said rotor, said face including a notch forming on each side along said air gap a major and a minor pole face, said stator poles being spaced apart through an arc whose length is about equal to the length of arc of said minor pole face, and each said major and minor pole faces of each stator pole extending throughout an arcuate length less than the arcuate length of the rotor poles and disposed



diametrically opposite a like pole face of the other stator pole whereby said rotor aligns substantially with a stator pole during the period of an energizing pulse and within the period between energizing pulses said rotor seeks a detent position rotationally removed therefrom to align substantially with one of said major pole faces; and

(c) means for supporting said rotor for rotation within said gap relative to said stator poles.

4,277,842

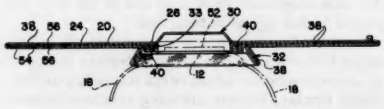
PROTECTIVE WATCH COVER

M. David Richards, 1109 E.Date, Brea, Calif. 92621

Filed Nov. 23, 1979, Ser. No. 96,917

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—282 **9 Claims**



1. A protective watch cover for wrist watches, comprising:

an elongated strap member having a central body portion including a central opening disposed therein;

a housing defined by an upper substantially flat wall and depending flange wall members, said flat wall having a central opening therein disposed to be contiguously aligned with said opening in said strap member when said strap and said housing are secured together, said housing being adapted to receive a watch therein;

a secondary crystal member adapted to be received in said contiguous openings and having the same peripheral configuration as said openings, said crystal being affixed within said housing;

an ornamental sheathing arranged to encapsulate said housing, and said elongated strap throughout its length; and

fastening means mounted to said elongated strap member, so as to hold said watch cover in place about said wrist watch.

4,277,843

CLOSED-LOOP TELECOMMUNICATION SYSTEM

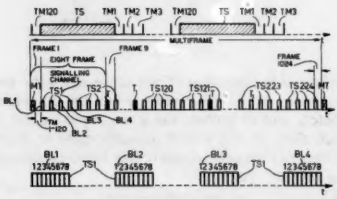
Michel G. A. Duquenne, Meudon-Bellevul; Guy A. J. David, Thiais; Jean-Claude Grima, Chatillon Sous Bagneux, and Jacques L. Daguet, Saint-Maur, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 849,711, Nov. 8, 1977, abandoned, which is a continuation of Ser. No. 666,653, Mar. 15, 1976, abandoned, which is a continuation of Ser. No. 541,728, Jan. 17, 1975, abandoned, which is a continuation of Ser. No. 320,497, Jan. 2, 1973, abandoned. This application Feb. 12, 1979, Ser. No. 11,580

Claims priority, application France, Dec. 21, 1971, 71.45976

Int. Cl.³ H04J *3/12*

U.S. Cl. 370—84 **5 Claims**



1. A time multiplex telecommunication system comprising a unidirectional transmission line, timing means connected to the ends of said line for determining the timing throughout the system, said timing means including means for generating timing signals defining periodically reocurring multiframes, each multiframe being divided into a plurality of frames of equal time intervals, each frame being divided into a non-message time interval and a plurality of message time intervals of equal duration, each frame having the same number of said message time intervals, each of said message time intervals defining a message channel for exchange of information between subscribers, said timing means further including means for providing on said line a multiframe synchronization code during the first non-message interval of each multiframe and means for providing, during at least one other non-message interval in the multiframe, a frame synchronization code, at least some of the remaining non-message time intervals of each multiframe defining a plurality of signalling channels each associated with a respective one of said message channels, said signalling channels having a repetition rate lower than the repetition rate of said message channels, said system further comprising a plurality of subscriber units and means for connecting said subscriber units to said line, said connecting means including means for detecting a free message channel and, upon request by a subscriber unit, for assigning a free message channel and an associated signal channel to that subscriber unit, means for interrupting transmission of signals through said line during the assignment of a free channel to the requesting subscriber unit, means for providing on said line signalling information such as the address of the subscriber unit to be called or the like during the time interval of a multiframe corresponding to said assigned signalling channel and means for providing on said line message information during the time interval of the multiframe corresponding to said assigned message channel.

4,277,844

METHOD OF DETECTING AND CORRECTING ERRORS IN DIGITAL DATA STORAGE SYSTEMS

Robert J. Hancock; William A. Burns, both of Boulder, and James B. Hall, Louisville, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

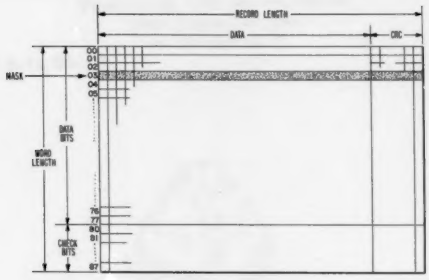
Filed Jul. 26, 1979, Ser. No. 61,025

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—38 **24 Claims**

1. Method of detecting errors in digital data, said data being

stored as an array of bits, said array having orthogonal extension in at least two dimensions, wherein the improvement comprises generating first parity-dependent check bits in each of said dimensions during the writing of said data into said array; regenerating comparable second check bits in each of said dimensions during the reading of said data from said array;



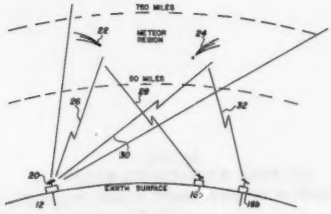
comparing said first and second check bits in at least one of said dimensions to generate an error syndrome; inverting bits identified as in error by said syndrome; and comparing said first and second check bits in the remaining of said dimensions, thus determining whether said inverting eliminated errors from said array.

4,277,845

METEOR SCATTER BURST COMMUNICATION SYSTEM

Dale K. Smith, Benton; Thomas G. Donich, Federal Way; Bobby V. Dickerson, Maple Valley, and Raymond E. Leader, Seattle, all of Wash., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 29, 1977, Ser. No. 820,206
Int. Cl.³ H04B *1/38*
U.S. Cl. 455—52 **38 Claims**



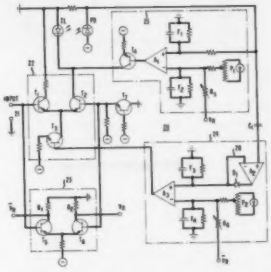
1. A meteor burst communications system comprising:
at least one master station,
a plurality of remote stations spaced at locations remote from said master station,
said master station including a radio transmitter for transmitting probing digital radio signals having address portions of selectively variable length, said probing digital radio signals being directed from said master station for reflection from meteor vapor trails to said remote stations,
each of said remote stations including a radio receiver for receiving said reflected probing digital radio signals from said master station,
each of said remote stations including address recognition circuitry having a predetermined digital address sequence stored therein and further having means to compare the received address portions with said stored digital address sequence,
at least one sensor of physical characteristics connected with each said remote station, and
each remote station including a transmitter for transmitting digital data representative of the output of said sensor to said master station via reflection from a meteor vapor trail if said received address portion compares with said stored digital address sequence in accordance with predetermined criteria based upon the length of said received address portion.

4,277,846

CIRCUIT FOR STABILIZING THE OUTPUT OF AN INJECTION LASER

Fang-Shang Chen, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1979, Ser. No. 107,510
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—611 **4 Claims**



1. A circuit for maintaining substantially constant the light output of the "ON" and "OFF" states of an injection laser to be supplied with an input signal train for use as the transmitter in a digital lightwave system comprising
means for monitoring the light output from a laser and developing a photovoltage which is a measure of such output,
control means supplied both with said photovoltage and with a voltage which is a measure of the duty cycle of the input train for providing a bias current to the laser which is a measure of the average light output compensated for the duty cycle,
control means supplied both with said photovoltage and with a voltage which is a measure of the duty cycle of the input train for providing a control voltage which is a measure of the difference between the peak light output and the average light output compensated for the duty cycle, and
means supplied both which the input train and said control voltage for providing modulating current to the laser.

DESIGNS

JULY 7, 1981

259,745

GARMENT

Alen S. York, New York, N.Y., and Judd M. York, Clover, S.C., assignors to Countess York, Ltd., Kings Mountain, N.C.

Filed Oct. 31, 1978, Ser. No. 956,419

Term of patent 14 years

Int. Cl. D2—*02, 01*

U.S. Cl. D2—29

259,746

SWEATER OR SIMILAR ARTICLE

Karen L. Dahlgard, Seattle, Wash., assignor to Standard Knitting Company, Seattle, Wash.

Filed Oct. 17, 1979, Ser. No. 85,914

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—44

259,747

SANDAL

Beverley Silvanov, 99 Gloucester Ave., London N.W. 1, England

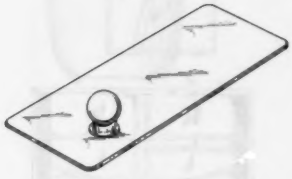
Filed Jul. 27, 1979, Ser. No. 61,431

Claims priority, application United Kingdom, Feb. 12, 1979, 988527/79

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—270



259,748

PHOTOGRAPHIC FILTER CASE

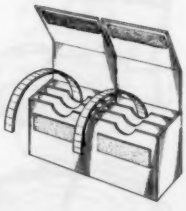
Miller Outcalt, 2036 Broadway, Santa Monica, Calif. 90404

Filed Sep. 28, 1979, Ser. No. 80,157

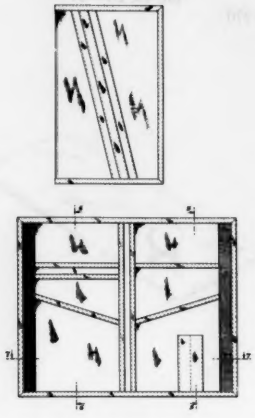
Term of patent 14 years

Int. Cl. D3—*02*

U.S. Cl. D3—33



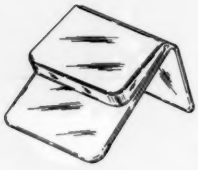
259,749
TRAVELER'S MULTI-POCKETED FOLDED POUCH OR THE LIKE
Terry W. McDonald, Rte. 6, Box 13, Quincy, Fla. 32351
Filed Aug. 6, 1979, Ser. No. 64,197
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—58



259,750
HIGH BACK OPEN ARM CHAIR
Randall P. Buhk, Wyoming, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed May 22, 1978, Ser. No. 908,144
The portion of the term of this patent subsequent to Oct. 23, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

259,751
BAR STOOL
Jobie G. Redmond, High Point, N.C., assignor to Jack Daniel Distillery, Lem Motlow, Prop., Inc., Lynchburg, Tenn.
Filed Nov. 8, 1978, Ser. No. 958,845
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32

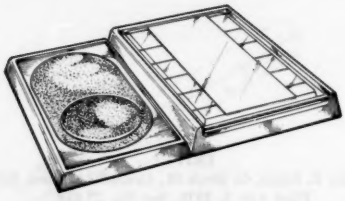
259,752
LEISURE CHAIR
Robert C. Geschwender, Lincoln, Nebr., assignor to Concept Engineering, Inc., Lincoln, Nebr.
Filed Sep. 26, 1978, Ser. No. 945,855
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



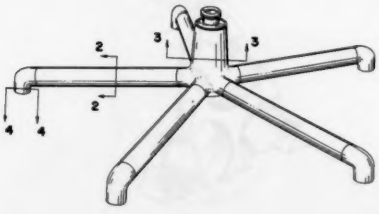
259,753
TOWEL BAR
Gary A. Fleischmann, Sheboygan, Wis., and Lawrence C. Peabody, Rindge, N.H., assignors to Kohler Co., Kohler, Wis.
Filed Apr. 10, 1980, Ser. No. 138,829
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99

259,754
TOWEL RING
Gary A. Fleischmann, Sheboygan, Wis., and Lawrence C. Peabody, Rindge, N.H., assignors to Kohler Co., Kohler, Wis.
Filed Apr. 10, 1980, Ser. No. 138,837
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99

259,755
COMBINED VENDING CABINET AND COIN TRAY
Richard W. Housman, 3416 Manning Ave., Los Angeles, Calif. 90064
Filed Apr. 7, 1978, Ser. No. 894,441
Term of patent 14 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—172

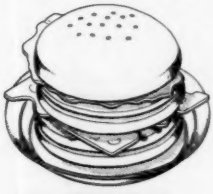


259,756
FURNITURE BASE
Don C. Albinson, Coopersburg, Pa., assignor to Collier-Keyworth Company, Gardner, Mass.
Filed Nov. 9, 1978, Ser. No. 959,376
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

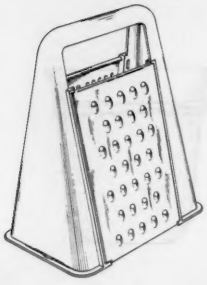


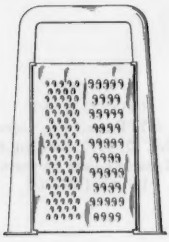
259,757
BEVERAGE CUP
Alain D. Perrin, Ruel Malmaison, France, assignor to Interdica, S.A., Villars-sur-Glane, Switzerland
Filed Feb. 23, 1979, Ser. No. 14,760
Claims priority, application Hague, Aug. 29, 1978, 67,448
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—15

259,758
COASTER SET
Jo Anne Marquardt, 4570 Francis Ct., Sacramento, Calif. 95822
Filed Jul. 27, 1979, Ser. No. 61,441
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—45

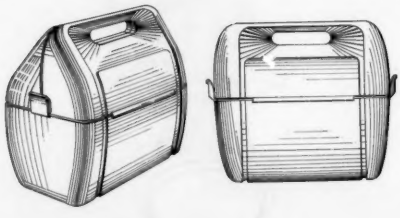


259,759
GRATER
Christopher Williams, London, England, assignor to Airfix Plastics Limited, Middlesex, England
Filed Oct. 19, 1979, Ser. No. 86,295
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47

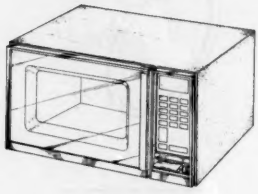




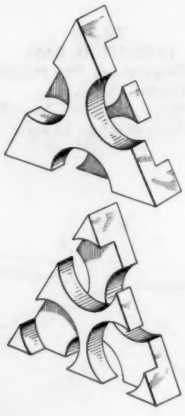
259,760
COOLER
Harry W. Lucas, Caledon East, and Gerald J. Adamson, Toronto, both of Canada, assignors to The Coleman Company, Inc., Wichita, Kans.
Filed May 30, 1978, Ser. No. 910,617
Term of patent 14 years
Int. Cl. D07—*07*; D03—*01*
U.S. Cl. D7—77



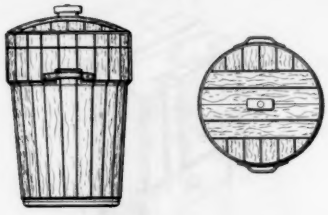
259,761
MICROWAVE OVEN
Masamichi Yamamura, Osaka; Toshio Harada, Shin, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 16, 1978, Ser. No. 934,328
Claims priority, application Japan, Feb. 20, 1978, 53-6237
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



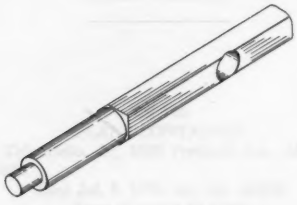
259,762
TRIVET
Christopher E. Sabin, 46 Birch St., Greenfield, Mass. 01301
Filed Apr. 5, 1979, Ser. No. 27,616
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—130



259,763
WASTE RECEPTACLE
Thomas Dickinson, University City, Mo., assignor to Contico International, Inc., St. Louis, Mo.
Filed Oct. 3, 1978, Ser. No. 948,203
The portion of the term of this patent subsequent to Jan. 31, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194



259,764
MOTORCYCLE HUB LOCK
Richard J. Fouhy, 8980 Westhill Rd., Lakeside, Calif. 92040
Filed Sep. 7, 1978, Ser. No. 940,180
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331



259,765
PLATE HANGER
Diane J. L. Kemper, 31870 Kingswood La., Apartment 22, Farmington, Mich. 48018
Filed Apr. 26, 1978, Ser. No. 900,334
Term of patent 14 years
Int. Cl. D8—*08;* D6—*04*
U.S. Cl. D8—355

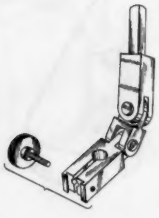
259,766
BOTTLE
Philip F. Hartung, Dean Bldg. 655 Main St., East Greenwich, R.I. 02818
Filed Nov. 21, 1978, Ser. No. 962,829
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

259,767
FUEL CONTAINER
George W. MacFarlane, P.O. Box 8513, Orlando, Fla. 32802
Filed Apr. 6, 1979, Ser. No. 27,941
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—374

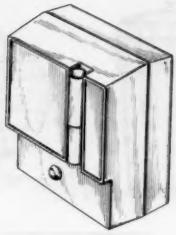
259,768
PACKAGING CONTAINER OR SIMILAR ARTICLE
Joseph G. Banasiak, Jr., Sayreville, N.J., assignor to North American Philips Corporation, New York, N.Y.
Filed Apr. 4, 1979, Ser. No. 28,013
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—414

259,769
COMBINED COVER AND BASE FOR A SQUEEZE TUBE OR THE LIKE
George S. Northrop, Babylon; John Hudik, Hauppauge, and Richard F. Schneider, Smithtown, all of N.Y., assignors to Tri-Molded Plastics Inc., Bay Shore, N.Y.
Filed Jan. 31, 1979, Ser. No. 8,167
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—455

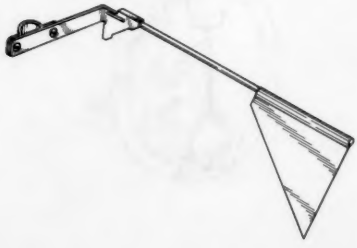
259,770
FLEXIBLE HOLDER FOR A DIAL TEST INDICATOR
Robert E. Leutz, 1090 El Camino, Redwood City, Calif. 94063
Filed May 15, 1979, Ser. No. 39,357
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—74



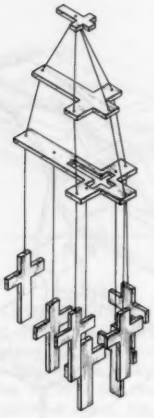
259,771
ALARM CABINET
Joseph T. Sullivan, 1170 Country La., Huntingdon Valley, Pa. 19006
Filed May 4, 1979, Ser. No. 35,910
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106



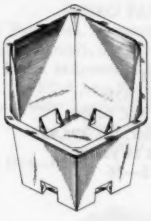
259,772
BICYCLE SAFETY FLAG
Donald Huntington, 1471 Home Ave., Menasha, Wis. 54952
Filed Apr. 2, 1979, Ser. No. 25,849
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



259,773
CROSS MOBILE
David Sweet, 15 Kellogg Rd., New Hartford, N.Y. 13413
Filed Feb. 28, 1978, Ser. No. 882,959
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—141



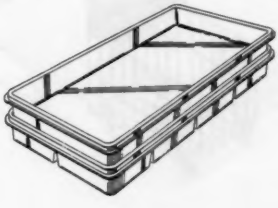
259,774
PLANT CONTAINER
Frank T. Criscitiello, Jr., 1080 Prospect Ave., Mountainside, N.J. 07092
Filed Jul. 9, 1979, Ser. No. 55,525
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—143



259,775
PLANTER
Donald K. Johnson, Barrington, Ill., assignor to Florists' Transworld Delivery Association, Southfield, Mich.
Filed May 22, 1978, Ser. No. 908,136
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—148

259,776
PLANTER BOWL
Martin J. Waterfield, Birmingham, Mich., assignor to Florists' Transworld Delivery Association, Southfield, Mich.
Filed Jul. 2, 1979, Ser. No. 54,190
Term of patent 7 years
Int. Cl. D11—*02*; D7—*01*
U.S. Cl. D11—153

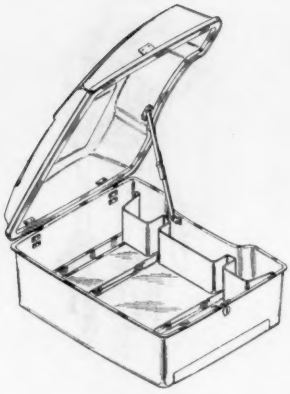
259,777
SELF-WATERING PLANT TRAY
John E. Ehrreich, Wayland, Mass., assignor to Ercon Corporation, Waltham, Mass.
Filed Oct. 7, 1977, Ser. No. 840,317
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



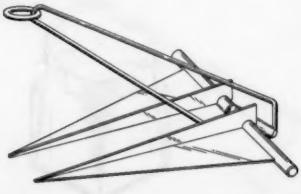
259,778
HORSEMAN FIGURE
Charles A. MacLean, 23073 Beech, Dearborn, Mich. 48124
Filed Apr. 27, 1979, Ser. No. 33,870
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—159

259,779
CART
Robert L. Bond, 307 Yoakum Pkwy., #525, Alexandria, Va. 22304
Filed Mar. 5, 1979, Ser. No. 17,820
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29

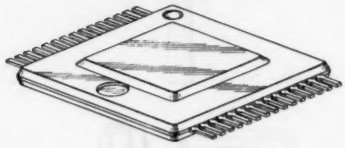
259,780
MOTORCYCLE LUGGAGE CARRIER
William G. Davidson, Elm Grove, Wis., assignor to AMF Incorporated, White Plains, N.Y.
Filed Aug. 16, 1979, Ser. No. 66,995
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



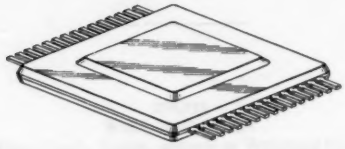
259,781
BOAT ANCHOR
Huntly S. Holmes, 103B, Dexter, Me. 04930
Filed Apr. 17, 1978, Ser. No. 896,922
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—215



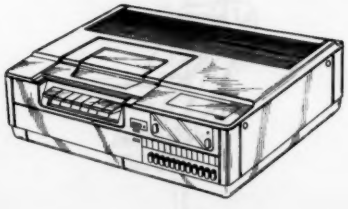
259,782
SEMICONDUCTOR
Hidetoshi Mochizuki, Fuchu; Keizo Otsuki, Higashiyamato; Hideki Kosaka, Kodaira, and Gen Murakami, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 24, 1979, Ser. No. 6,193
Claims priority, application Japan, Jul. 28, 1978, 53-31693
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—99



259,783
SEMICONDUCTOR
Hidetoshi Mochizuki, Fuchu; Keizo Otsuki, Higashiyamayo; Hideki Kosaka, Kodaira, and Gen Murakami, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 26, 1979, Ser. No. 15,160
Claims priority, application Japan, Aug. 25, 1978, 53-35732
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—99

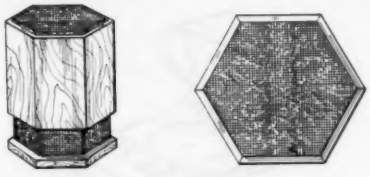


259,784
VIDEO TAPE RECORDER
Masaaki Furukawa, Sagamihara; Noboru Onozaki, Ohmorinishi; Hideo Kondoh, and Michiko Nishibayashi, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 9, 1978, Ser. No. 932,413
Claims priority, application Japan, Feb. 15, 1978, 53-4998
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—02

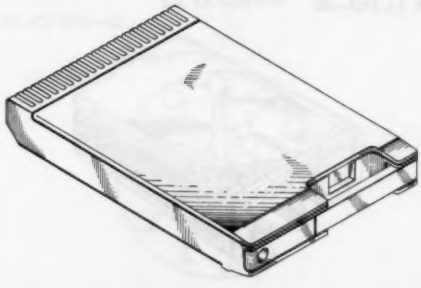


259,785
COMBINED TAPE RECORDER AND RADIO RECEIVER
Keizo Kushida, Hirakata; Toshio Igo, Katano; Munenori Fujimoto, Neyagawa; Kunio Hoshino, Katano; Satoru Usami, Hirakata; Kazumasa Takenaka, Katano; Kikuo Ohta, Ikoma, and Benito Mishiro, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 27, 1978, Ser. No. 946,855
Claims priority, application Japan, Apr. 4, 1978, 53-13243
Term of patent 14 years
Int. Cl. D14—*03, 01*
U.S. Cl. D14—5

259,786
CONFERENCING TELEPHONE UNIT
Fred D. Leeson; Henry A. Main, both of London, and Clifford D. Read, Almonte, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Oct. 3, 1978, Ser. No. 948,205
Term of patent 14 years
Int. Cl. D14—*03;* D6—*03*
U.S. Cl. D14—57



259,787
VEHICULAR TWO-WAY RADIO OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 19, 1979, Ser. No. 21,525
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

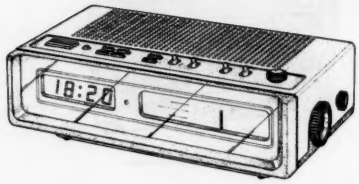


259,788

CLOCK RADIO

Setsuo Miyanaga, Neyagawa, and Benito Mishiro, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 27, 1979, Ser. No. 98,377
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D14—73

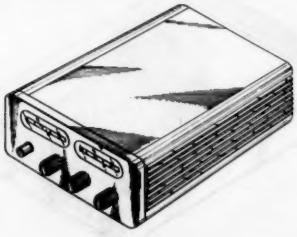


259,789

MOUNTED AMPLIFIER

Ikuo Watanabe, 3-12-8, Oji, Kita-ku, Tokyo, Japan

Filed Apr. 3, 1978, Ser. No. 893,170
Claims priority, application Japan, Dec. 21, 1977, 52-50187
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96

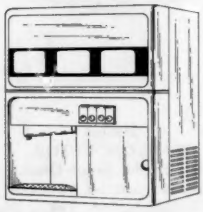


259,790

BEVERAGE MACHINE

Harry Hentschel, Munich, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 16,937
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1978, 4881
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—112



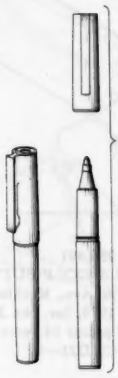
259,791

MACHINE FOR SORTING AND SEPARATING ALUMINUM CANS

Charles M. Davis, Jr., 23 The Point, Coronado, Calif. 92118

Filed Apr. 3, 1978, Ser. No. 893,154
Term of patent 14 years
Int. Cl. D15—*99;* D12—*05*
U.S. Cl. D15—147

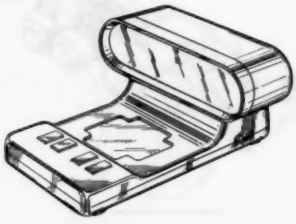
259,792
MARKING PEN OR SIMILAR ARTICLE
Kunio Itoh, and Shigeo Oka, both of Tokyo, Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 8, 1978, Ser. No. 967,838
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51



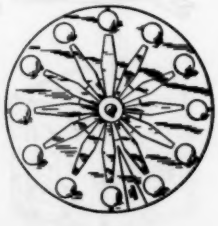
259,793
BALL-POINT PEN
Alain Carre, Paris, France, assignor to Waterman S.A., Paris, France
Filed Jul. 18, 1979, Ser. No. 58,496
Claims priority, application France, Mar. 6, 1979, 77,375
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

259,794
COMBINED DESK SET, PEN HOLDER AND THERMOMETER
Walter Henkels, Holunderweg 1, 5142 Hückelhoven, Fed. Rep. of Germany
Filed Aug. 13, 1979, Ser. No. 65,969
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, MR 122
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75

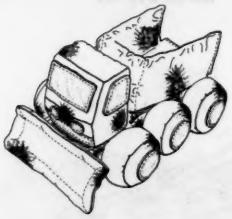
259,795
ELECTRONIC WORD GAME HOUSING
Angelo S. Longo, Huntington, N.Y., assignor to Selchow & Righter Company, Bay Shore, N.Y.
Filed Jun. 25, 1979, Ser. No. 51,857
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



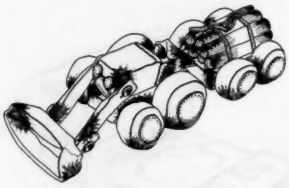
259,796
GAME SPINNER
Milton Meyer, 3157 Werk Rd., Cincinnati, Ohio 45211
Filed May 8, 1978, Ser. No. 903,995
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—22



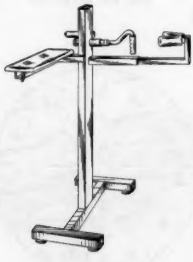
259,797
TOY DUMP TRUCK
Gloria Merchant, R.R. 4, Box 98, William Henry Rd., North Scituate, R.I. 02857
Filed Nov. 13, 1978, Ser. No. 960,846
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134



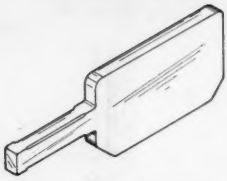
259,798
COMBINED TOY TRACTOR, FLATBED AND LOGS THEREFORE
Gloria Merchant, R.R. 4, Box 98, William Henry Rd., North Scituate, R.I. 02857
Filed Nov. 13, 1978, Ser. No. 960,845
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—135



259,799
FOREARM EXERCISER
Jerry D. Brentham, P.O. Box 599, Belton, Tex. 76513
Filed Apr. 23, 1979, Ser. No. 32,552
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



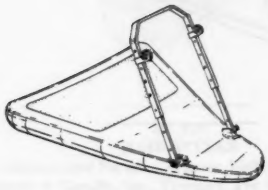
259,800
BALL PADDLE OR SIMILAR ARTICLE
Le Mar M. Gearhart, II, 333 E. Carrillo St., #6, Santa Barbara, Calif. 93101
Filed May 14, 1979, Ser. No. 38,530
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—213



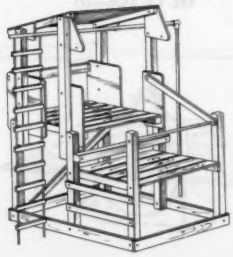
259,801
HEAD FOR A GOLF PUTTER
Tony J. Vella, 3504 Wesleyan Ave., Rockford, Ill. 61108
Filed May 7, 1979, Ser. No. 36,747
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

259,802
GOLF CLUB GRIP
Jeffrey M. Williams, Laurinburg, N.C., assignor to Eaton Corporation, Cleveland, Ohio
Filed Jun. 1, 1979, Ser. No. 44,435
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—222

259,803
WATER SKI-FLOAT
Dennie L. Coffin, 14 Mastenbrook Ct., Gaithersburg, Md. 20760
Filed Jul. 25, 1978, Ser. No. 928,011
Claims priority, application United Kingdom, Dec. 7, 1977, 982523/77
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—228



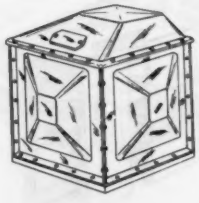
259,804
PLAYHOUSE CLIMBER
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Mar. 15, 1979, Ser. No. 20,879
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245



259,805
CLIMBING STAND
Herman Persson, Varvsgatan 26, 290 20 Ahus, Sweden
Filed Jul. 11, 1979, Ser. No. 56,809
Claims priority, application Sweden, Jan. 29, 1979, 79-0232
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245

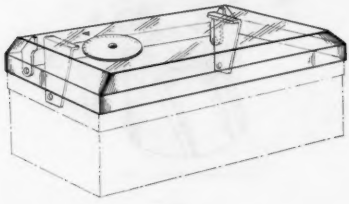
259,806
SLUG FOR A SHOTGUN
Kihachiro Kimura, Room 501, Lions Mansion Shiba Koen Daini, 6-2, Mita 1-chome, Minato-ku, Tokyo, 108, Japan
Filed Jun. 27, 1979, Ser. No. 52,580
Claims priority, application Japan, Dec. 28, 1978, 53-54592
Term of patent 14 years
Int. Cl. D22—*03*
U.S. Cl. D22—10

259,807
STORAGE TANK FOR LIQUIDS OR THE LIKE
Keisaku Koga, Ibaraki, and Takeshi Iseda, Yahata, both of Japan, assignors to Sekisui Koji Kabushiki Kaisha, Japan
Filed Oct. 13, 1978, Ser. No. 951,355
Claims priority, application Japan, Apr. 24, 1978, 53-16615
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

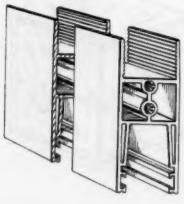


259,808
STOVE
David K. Halls, 296 E. 300 North, Manti, Utah 84642
Filed May 21, 1979, Ser. No. 40,768
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

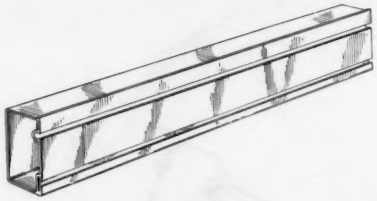
259,809
TRANSPARENT COVER FOR A MEDICAL DISINFECTANT HOUSING OR SIMILAR ARTICLE
Joseph J. Lancellotti, 8 Starr Rd., East Brunswick, N.J. 08816, and Michel S. Schwartz, 14 Clover Dr., Great Neck, N.Y. 11021
Filed Mar. 30, 1978, Ser. No. 891,929
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—29



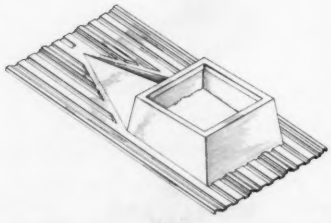
259,810
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Sep. 14, 1978, Ser. No. 942,392
Claims priority, application Canada, Mar. 17, 1978, 1703781
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



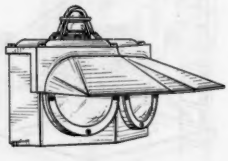
259,811
EXTRUDED MOLDING
Richard Guy, 27752 Torija, Mission Viejo, Calif. 92691
Filed Oct. 30, 1978, Ser. No. 956,070
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



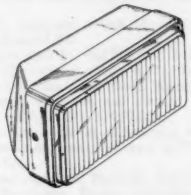
259,812
ROOF PANEL
Warren D. Smith, South Bend, Ind., assignor to Glaspec Corporation, South Bend, Ind.
Filed Jun. 7, 1979, Ser. No. 46,208
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—80



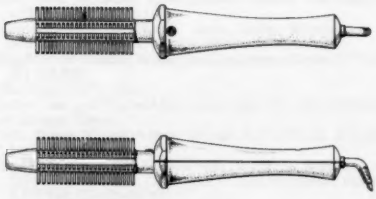
259,813
HELIPORT FLOODLIGHT
James R. Downing, 10218 Donna Ave., Northridge, Calif. 91324
Filed Jan. 29, 1979, Ser. No. 7,072
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D26—24



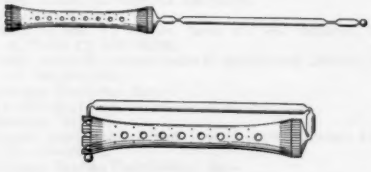
259,814
FOG LIGHT
Hisao Yabata, Takasaki, Japan, assignor to Ichikawa Press Industries Co., Ltd., Takasaki, Japan
Filed Apr. 5, 1979, Ser. No. 27,599
Claims priority, application Japan, Feb. 16, 1979, 54-5567
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—28



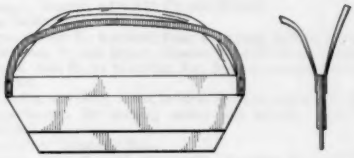
259,815
HAIR STYLER
Rayko Ergaver, and Nevenka Ergaver, both of Toronto, Canada, assignors to Capella, Inc., Freeport, The Bahamas
Filed May 29, 1979, Ser. No. 43,082
Claims priority, application France, Aug. 28, 1978, 76 823; Spain, Aug. 30, 1978, 92959; Switzerland, Sep. 12, 1978, 110039; Belgium, Sep. 18, 1978, 4583; Sweden, Sep. 20, 1978, 78-2158; Canada, Sep. 26, 1978, 45024; Japan, Sep. 27, 1978, 53-40974; Fed. Rep. of Germany, Sep. 29, 1978, 945/78; Australia, Oct. 9, 1978, 76117; United Kingdom, Jan. 30, 1979, 988323/79; Denmark, Feb. 12, 1979, 125/79
Term of patent years
Int. Cl. D28—*03*
U.S. Cl. D28—35



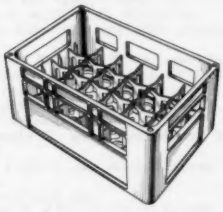
259,816
PERMANENT WAVE ROD
Larry C. Sledge, Bethel, Conn., assignor to Clairol Incorporated, New York, N.Y.
Filed Aug. 20, 1979, Ser. No. 68,258
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



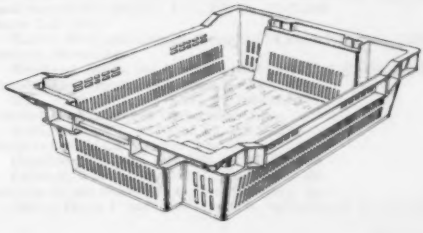
259,817
DUST RESPIRATOR
Willard C. White, Huntington, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 926,481, Jul. 20, 1978, abandoned. This application Sep. 10, 1979, Ser. No. 74,212
Term of patent 14 years
Int. Cl. D29—*02*; D24—*9*
U.S. Cl. D29—8



259,818
PLASTIC CRATE
Graham Beavis, 47 Rooikcrans Crescent, Van Riebeeck Park, Kempton Park 1620, South Africa
Filed Mar. 21, 1979, Ser. No. 22,468
Claims priority, application Canada, Oct. 24, 1978, 2410784
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—44



259,819
TRAY
Jean Cornou, Verrieres-le-Buisson, France, assignor to Allibert Exploitation Societe Anonyme, Grenoble, France
Filed Apr. 16, 1979, Ser. No. 30,522
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—44



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TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF JULY, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Materne, Carsten; and Betzing, Hans, 4,277,483, Cl. 424-263.000.

A-T-O Inc.: *See—*
Miller, James S.; Lauyans, Frank M.; and Hilger, Edwin T., 4,277,217, Cl. 414-395.000.

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Perez, Arthur; and Abraham, Fayez F., 4,276,755, Cl. 62-196.00B.

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Ackermann, Peter: *See—*
Farooq, Saleem; Ackermann, Peter; Drabek, Jozef; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,277,494, Cl. 424-305.000.

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Romano, Paul L., 4,276,954, Cl. 181-224.000.

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Walter, Karl H.; Johnston, John D.; and Wetherley, Dennis, 4,277,253, Cl. 23-313.00R.

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Audone, Bruno; Bolla, Luciano; and Gerbi, Giuseppe, 4,277,744, Cl. 324-72.000.

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Tateishi, Tetsuya, 4,277,828, Cl. 364-415.000.

AGFA-Gevaert, A.G.: *See—*
Gref, Hans; Hofmann, Hans; Zander, Werner; and Busch, Josef, 4,276,853, Cl. 118-643.000.
Jager, Gerhard; von Konig, Anita; Liebe, Werner; and Voigt, Armin, 4,277,557, Cl. 430-446.000.
Nagel, Erich; Turcke, Rainer; and Ludemann, Heinz, 4,277,061, Cl. 271-302.000.

AGFA-Gevaert N.V.: *See—*
Jacken, Jan; and Verhecken, Andre, 4,277,559, Cl. 430-549.000.

Aggen, George: *See—*
Lula, Remus A.; and Aggen, George, 4,277,374, Cl. 252-446.000.

Aguf, Igor A.: *See—*
Barsukov, Vyacheslav Z.; Dunovsky, Sergei A.; Sagoian, Lenik N.; Trepalin, Anatoly I.; Aguf, Igor A.; and Smolkova, Valentina S., 4,277,546, Cl. 429-59.000.

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Heywood, Joseph R., 4,276,894, Cl. 133-5.00R.

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Takada, Shigetaka; Naruse, Kazumichi; and Watanabe, Yukihiro, 4,276,745, Cl. 60-276.000.

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Yamanaka, Minoru; and Tamura, Tooru, 4,276,746, Cl. 60-290.000.

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Kondo, Shiro; and Akazawa, Michitada, 4,277,665, Cl. 200-314.000.

Akebono Brake Industry Co., Ltd.: *See—*
Iwata, Yoichi, 4,276,964, Cl. 188-73.300.

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Nally, Robert B.; Akister, James F.; and Trohatos, George, 4,277,775, Cl. 340-146.30Q.
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Leinfelt, Karl E., 4,277,265, Cl. 55-302.000.

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Pejchal, Karel; Fritzon, Hans G.; and Lindstrom, Raimo, 4,276,912, Cl. 139-437.000.

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Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,277,589, Cl. 526-122.000.

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Williams, Thomas A.; and Cussons, Frank M., 4,277,455, Cl. 423-321.00S.

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Montgrain, Luc, 4,277,280, Cl. 75-68.00R.

Alfano, Robert R.; and Schiller, Norman H., to Hamamatsu T.V. Co, Ltd. Method and device for detecting the threshold of generation of a laser beam. 4,277,669, Cl. 219-121.0LK.

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Peckinpaugh, Frank L.; and Biron, Raymond J., 4,277,430, Cl. 264-129.000.

Allis-Chalmers Corporation: *See—*
Dilworth, Louis R., 4,277,450, Cl. 423-244.000.

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Alongi, Robert E.: *See—*
Yates, Robert E.; Leonard, John P.; Alongi, Robert E.; Albanes, Wilfredo V.; and Bishop, Charles M., 4,277,038, Cl. 244-3.150.

Alpha Solarco Inc.: *See—*
Uroshevich, Miroslav, 4,276,873, Cl. 126-438.000.

Alps Electric Co., Ltd.: *See—*
Kondo, Shiro; and Akazawa, Michitada, 4,277,665, Cl. 200-314.000.

Aluminum Company of America: *See—*
Turley, Bernard C.; and Hochbein, David E., 4,277,093, Cl. 294-83.00R.

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Nishikawa, Masaji; and Amemiya, Norio, 4,277,550, Cl. 430-68.000.

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Stein, Reinhardt P., 4,277,609, Cl. 548-125.000.

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Aulik, Clarence J., 4,276,962, Cl. 188-1.00D.

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Hamilton, W. Duane, 4,277,044, Cl. 248-571.000.
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Bubley, Henry J.; and Oltra, Claude H., 4,276,826, Cl. 101-123.000.

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Andrews, James P.; Callahan, Arthur C.; and Gendy, Moheb M., 4,277,290, Cl. 134-10.000.
Aminoil, USA, Inc.: *See—*
Grant, Norman A., 4,277,416, Cl. 518-703.000.
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Loose, Winfield W.; and MacDougall, Alan R., 4,277,124, Cl. 339-99.00R.
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Gerst, Carl W.; and Paciorek, Leonard J., 4,277,748, Cl. 324-83.00D.
Anciaux widow Wastesaeger, Martine: *See—*
Michel, Joseph P., 4,277,570, Cl. 521-106.000.
Anciens Etablissements Leon Guilbert & Fils: *See—*
Moumaneix, Francis; and Marietta, Cesar, 4,277,031, Cl. 239-414.000.
Andco Incorporated: *See—*
Mamula, Ronald S.; and Dotson, Samuel C., 4,276,956, Cl. 182-128.000.
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Anderson, Douglas E. Recovery apparatus. 4,276,846, Cl. 114-52.000.
Anderson, Douglas O.: *See—*
McKenna, James F.; and Anderson, Douglas O., 4,277,312, Cl. 202-241.000.
Anderson, John L.; Davidson, John C.; Schaaf, Henry W.; and Meis, Charles H., to Lindsay Manufacturing Company. Center pivot irrigation system with corner watering arrangement. 4,277,023, Cl. 239-11.000.
Anderson, Robert A., to Lucas Industries Limited. Spreading disc brakes for vehicles. 4,276,963, Cl. 188-71.400.
Andreoni, Alessandro: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,277,491, Cl. 424-285.000.
Andrews, James P.; Callahan, Arthur C.; and Gendy, Moheb M., to American Sterilizer Company. Low temperature washing and chemical sanitizing of foodware. 4,277,290, Cl. 134-10.000.
Andrillon, Patrick: *See—*
Bugaut, Andree; and Andrillon, Patrick, 4,277,244, Cl. 8-410.000.
Annen, Klaus: *See—*
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, 4,277,468, Cl. 424-243.000.
Anpartsselskab: *See—*
Kirkegaard, Allan K., 4,276,940, Cl. 172-42.000.
Aoyagi, Hirofumi: *See—*
Mori, Shunichiro; Kimata, Kunio; Aoyagi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,671, Cl. 219-494.000.
Aoygi, Hirofumi: *See—*
Mori, Shun'ichiro; Kimata, Kunio; Aoygi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,670, Cl. 219-492.000.
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Apelgren, Roland G., to Aktiebolaget Svenska Flaktfabriken. Cleaning process control method for textile barrier filter material. 4,277,255, Cl. 55-20.000.
Apex Chemical Company, Inc.: *See—*
Hermann, Gerson; Patel, Babubhai C.; and Patel, Sudhakerbhai B., 4,277,379, Cl. 252-608.000.
Apsit, Voldemar V.: *See—*
Sika, Zigurd K.; Apsit, Voldemar V.; Daugulis, Khubert L.; and Kurkalov, Ivan I., 4,276,832, Cl. 104-292.000.
APURA GmbH: *See—*
Baumann, Manfred; and Besserer, Walter, 4,276,797, Cl. 83-308.000.
Aquino, Agostino J.: *See—*
Koppa, Daniel A.; and Aquino, Agostino J., 4,276,800, Cl. 83-863.000.
Arai, Shoji: *See—*
Saito, Toshihiro; Tsutsumi, Yukihiro; Arai, Shoji; and Matsunaga, Hideaki, 4,277,414, Cl. 260-429.00R.
ARBED, Acieries Reunies de Burbach-Eich-Dudelange, Societe Anonyme: *See—*
Schmitz, Fernand, 4,276,763, Cl. 72-234.000.
Archambaud, Denis G.; and Dermy, Rene M., to Compagnie Francaise des Petroles. Positioning of the end of an underwater flowline. 4,277,202, Cl. 405-169.000.
Archibald, G. Kent, to Avi, Inc. IV Pump with empty supply reservoir and occlusion detector. 4,277,226, Cl. 417-38.000.
Arend, Inez F.; and Locke, James S., to Northern Telecom Limited. Single frequency tone receiver. 4,277,650, Cl. 179-84.0VF.
Argyll, Marion H. Sludge separation plant. 4,276,915, Cl. 141-98.000.
Arikawa, Yoshijiro: *See—*
Kanehori, Keiichi; Horigome, Shinkichi; Katsumoto, Masayuki; and Arikawa, Yoshijiro, 4,277,452, Cl. 423-246.000.
Arkens, Charles T., to Rohm and Haas Company. Heteropolymer acrylic latices and textiles treated therewith. 4,277,384, Cl. 260-29.6RB.
Armour and Company: *See—*
Sato, Kunito; Miller, Alfred F.; and Zimont, Leonard J., 4,277,508, Cl. 426-266.000.
Arnoldussen, Thomas C., to General Motors Corporation. Display device having reduced electrochromic film dissolution. 4,277,147, Cl. 350-357.000.
Arvey Corporation: *See—*
Sibrava, Joseph S.; and Caroselli, Frank E., 4,276,982, Cl. 206-439.000.
Asada, Touru; Miura, Yasuhisa; and Yoshino, Tsutomu, to Dainippon Ink & Chemicals Inc. Process for production of 1,17-diamino-9-azaheptadecane. 4,277,622, Cl. 564-512.000.
Asahi-Dow Limited: *See—*
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,277,578, Cl. 525-211.000.
Asahi Glass Company, Ltd.: *See—*
Oda, Yoshio; Yamabe, Masaaki; and Kato, Masao, 4,277,565, Cl. 521-31.000.
Ukihashi, Hiroshi; Yamabe, Masaaki; and Kojima, Hiroaki, 4,277,586, Cl. 526-93.000.
Asai, Akira: *See—*
Nakai, Toshio; Kuzuya, Susumu; Onoda, Hiroshi; Iwase, Takayuki; and Asai, Akira, 4,277,192, Cl. 400-671.000.
Asai, Tsuyoshi: *See—*
Tobioka, Masaaki; Kodama, Mitsuo; Asai, Tsuyoshi; and Yamamoto, Takaharu, 4,277,283, Cl. 75-238.000.
Asanae, Masumi; and Noguchi, Kohji, to Hitachi Metals, Ltd. Magnetic developing process and toner containing high coercive force magnetic powder. 4,277,552, Cl. 430-122.000.
ASEA Aktiebolag: *See—*
Jorendal, Gunnar; and von Renteln, Adrian, 4,277,770, Cl. 336-60.000.
Olsson, Karl E., 4,277,639, Cl. 174-42.000.
Stenkvist, Sven-Einar, 4,277,638, Cl. 13-35.000.
Ash, Arthur A., Sr. Bar soap receptacle. 4,277,042, Cl. 248-309.00R.
Ash, John E. Method and apparatus for releasing an elevated pressure developed behind a wall. 4,276,725, Cl. 52-1.000.
Ashie, Yutaka: *See—*
Nakajima, Hideiku; Koyama, Itsuji; Kusama, You; and Ashie, Yutaka, 4,277,524, Cl. 427-362.000.
Ashland Oil, Inc.: *See—*
Norton, Richard V.; Frank, Peter J.; Fisher, Dennis H.; and Howe, Steven C., 4,277,636, Cl. 585-14.000.
Ashton, Wallace T.: *See—*
Tolman, Richard L.; Ashton, Wallace T.; and Brown, Ronald D., 4,277,603, Cl. 544-250.000.
Astek Engineering, Inc.: *See—*
Drake, Samuel H.; and Simunovic, Sergio N., 4,276,697, Cl. 33-169.00C.
Astro Resources Corporation: *See—*
Ejzak, Edward M., 4,277,438, Cl. 422-80.000.
Atack, Joseph, to Fire (Waterless Sprinklers) Limited. Fire detection and extinguishing systems. 4,276,939, Cl. 169-60.000.
Ateliers de la Motobecane: *See—*
Jaulmes, Christian, 4,276,858, Cl. 123-73.0CC.
Atlantic Richfield Company: *See—*
Blake, Floyd A.; and Northrup, Lynn L., Jr., 4,276,872, Cl. 126-425.000.
Szulinski, Milton J., 4,277,361, Cl. 422-120.000.
Au, Dean T.: *See—*
Saunders, Robert C.; Au, Dean T.; Williams, W. Ray; and Zurek, Donald, 4,277,831, Cl. 364-481.000.
Audone, Bruno; Bolla, Luciano; and Gerbi, Giuseppe, to Aeritalia S.p.A. Settore Avionica. Apparatus for measuring electric and magnetic fields. 4,277,744, Cl. 324-72.000.
Aulik, Clarence J., to American Hospital Supply Corporation. Caster brake for stretcher or the like. 4,276,962, Cl. 188-1.00D.
Aumick, James M.: *See—*
Webb, Paul D.; Kiefer, William J.; and Aumick, James M., 4,276,960, Cl. 184-6.220.
Aurora Products Canada, Ltd.: *See—*
Zbriger, Michael J.; and Passamenti, Anthony, 4,276,717, Cl. 46-262.000.
Austin, John J., to Champion International Corporation. Supportive sidewall container for expandable food packages. 4,277,506, Cl. 426-111.000.
Australian Atomic Energy Commision: *See—*
McLaren, Keith G., 4,277,242, Cl. 8-128.00A.
Automation Industries, Inc.: *See—*
Ball, David J., 4,277,125, Cl. 339-113.00R.
Kutnyak, Thomas A.; Koerber, Marvin A.; and Wills, Henry K., 4,277,640, Cl. 174-47.000.
Avco Corporation: *See—*
Waddington, Clive, 4,276,784, Cl. 74-336.00R.
Avi, Inc.: *See—*
Archibald, G. Kent, 4,277,226, Cl. 417-38.000.
Ayers, David T., to Kelsey-Hayes Company. Automatic adjusting strut. 4,276,966, Cl. 188-79.50P.
Baalham, Christopher J.: *See—*
Thompson, Eric; and Baalham, Christopher J., 4,277,601, Cl. 544-22.000.
Babcock-Hitachi Kabushiki Kaisha: *See—*
Kanehori, Keiichi; Horigome, Shinkichi; Katsumoto, Masayuki; and Arikawa, Yoshijiro, 4,277,452, Cl. 423-246.000.

Baggs, Burton D.: *See*—
Smith, Alexander; and Baggs, Burton D., 4,277,080, Cl. 280-473.000.
Baker, William H. Wave-making apparatus. 4,276,661, Cl. 4-491.000.
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Balco, Inc.: *See*—
Balzer, Claude P.; and Corman, Edward M., 4,276,728, Cl. 52-177.000.
Baldwin, John L. E., to Independent Broadcasting Authority. Recording digital signals. 4,277,807, Cl. 360-32.000.
Baldwin Piano & Organ Company: *See*—
Fritz, William L., 4,276,803, Cl. 84-343.000.
Ball, David J., to Automation Industries, Inc. Enhanced detent guide track with dog-leg. 4,277,125, Cl. 339-113.00R.
Balzer, Claude P.; and Corman, Edward M., to Balco, Inc. Dirt removing grid system for floors. 4,276,728, Cl. 52-177.000.
Banjavic, Richard A.: *See*—
Madsen, Ernest L.; Zagzebski, James A.; Banjavic, Richard A.; and Burlew, Michele M., 4,277,367, Cl. 252-408.000.
Banks, Edwin L., Jr.: *See*—
Dowell, Terrence P.; Banks, Edwin L., Jr.; and Luce, Carl T., 4,276,967, Cl. 188-134.000.
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Barclay, David K.: *See*—
Yunker, Michael P.; and Barclay, David K., 4,276,710, Cl. 43-4.000.
Bargeron, Thomas C.; and Moodie, Stanley T. Liquid spring stanchion. 4,277,045, Cl. 248-599.000.
Bargiel, Stefan, to Newage Kitchens Limited. Corner fittings. 4,277,122, Cl. 312-330.00R.
Barlics, John J. Cover and aerosol activator for aerosol spray can. 4,277,004, Cl. 222-402.140.
Baron, Richard D.: *See*—
de Fasselle, Robert J.; Baron, Richard D.; and Nottke, James E., 4,276,734, Cl. 53-77.000.
Barruw, Jacob. Truck rails and time saver. 4,277,095, Cl. 296-24.00B.
Barry Wright Corporation: *See*—
Dowell, Terrence P.; Banks, Edwin L., Jr.; and Luce, Carl T., 4,276,967, Cl. 188-134.000.
Barsukov, Vyacheslav Z.; Dunovsky, Sergei A.; Sagoian, Lenik N.; Trepalin, Anatoly I.; Aguf, Igor A.; and Smolkova, Valentina S. Sealed lead-acid storage battery. 4,277,546, Cl. 429-59.000.
Barth, Clifford E.: *See*—
Barth, William L.; and Barth, Clifford E., 4,276,705, Cl. 40-579.000.
Barth, William L.; and Barth, Clifford E. Graphical display means. 4,276,705, Cl. 40-579.000.
Bartlett, Charles J.; Rhodes, Ronald J.; and Rust, Ray D., to Bell Telephone Laboratories, Incorporated. Treating multilayer printed wiring boards. 4,277,321, Cl. 204-192.00E.
BASF Aktiengesellschaft: *See*—
Eicken, Karl; and Wuerzer, Bruno, 4,277,278, Cl. 71-92.000.
Falkenstein, Georg; and Kessler, Hansjuergen, 4,277,571, Cl. 521-164.000.
Hagen, Helmut; Kohler, Rolf-Dieter; and Markert, Juergen, 4,277,477, Cl. 424-251.000.
Lindner, Alfred; Volkamer, Klaus; and Wagner, Ulrich, 4,277,314, Cl. 203-50.000.
Mueller, Herbert; Paulus, Gerhard; Schoeppl, Hubert; and Scharf, Emil, 4,277,422, Cl. 260-791.000.
Naarmann, Herbert; Penzien, Klaus; Doerfel, Helmut; and Eckell, Albrecht, 4,277,588, Cl. 526-114.000.
Straub, Ferdinand; Spoor, Herbert; and Cordes, Claus, 4,277,576, Cl. 525-123.000.
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,277,315, Cl. 203-51.000.
BASF Wyandotte Corporation: *See*—
Inks, Clyde G.; Compton, John W.; Ellerman, Kathryn M.; and Bergman, Lee H., 4,277,520, Cl. 427-220.000.
Basic Incorporated: *See*—
Fisher, Theodore H., II; and Cusimano, Richard J., 4,277,651, Cl. 179-90.00B.
Basili, Luigi: *See*—
Caldo, Cornelio; and Basili, Luigi, 4,277,371, Cl. 252-429.00B.
Baskin, Craig P.: *See*—
Dauben, William G.; Baskin, Craig P.; and vanRiel, Herman C. H. A., 4,277,604, Cl. 546-44.000.
Bass, Merlyn D.; and Demorest, Donald W., to Deere & Company. Safety lock for raising and lowering mechanism. 4,276,814, Cl. 92-23.000.
Bastgen, Wendel, to Alb. Klein & Co. GmbH KG. Apparatus for the batch filtering of suspensions. 4,276,822, Cl. 100-207.000.
Battelle Memorial Institute: *See*—
Rufer, Willy; and Menzi, Robert, 4,277,513, Cl. 426-656.000.
Bauer, Claude J.; and Moore, Kenneth M., to GTE Products Corporation. Electrical outlet box and cable clamp device. 4,277,641, Cl. 174-65.00R.
Baughn, John W., to Gelman Sciences, Inc. Water purifier. 4,277,332, Cl. 210-96.200.
Baumann, Manfred; and Besserer, Walter, to APURA GmbH. Apparatus for dispensing sheets of web material of predetermined length. 4,276,797, Cl. 83-308.000.
Bausch & Lomb Incorporated: *See*—
Deichert, William G.; Niu, Gregory C.; and VanBuren, Martin F., 4,277,595, Cl. 528-26.000.
Bausch, Max: *See*—
Klein, Wilhelm; Bausch, Max; and Eckert, Dieter, 4,277,099, Cl. 296-146.000.
Baxter Travenol Laboratories, Inc.: *See*—
Schnell, William J., 4,276,687, Cl. 29-407.000.
Bayer Aktiengesellschaft: *See*—
Beck, Manfred; and Gobel, Wilhelm, 4,277,579, Cl. 525-344.000.
Berendes, Otto; and Vopel, Karl-Heinz, 4,277,459, Cl. 423-567.00A.
Dorn, Hubert; and Voege, Herbert, 4,277,467, Cl. 424-217.000.
Dorsch, Hans-Lothar; and Hermann, Karl H., 4,277,396, Cl. 260-146.00R.
Groll, Manfred; Kuhnel, Werner; and Kuth, Robert, 4,277,245, Cl. 8-532.000.
Podszun, Wolfgang; Suling, Carlhans; Walkowiak, Michael; and Schulz, Hans H., 4,277,536, Cl. 428-402.000.
Sirrenberg, Wilhelm; Klauke, Erich; Marhold, Albrecht; Hammann, Ingeborg; Stendel, Wilhelm; and Krehan, Ingomar, 4,277,499, Cl. 424-322.000.
Bayh, Russell I., III: *See*—
Calhoun, Michael B.; Bayh, Russell I., III; and Dutton, Robert E., 4,276,937, Cl. 166-323.000.
Baylor College of Medicine: *See*—
Melnick, Joseph L.; and Wallis, Craig, 4,277,250, Cl. 23-230.00B.
Beck, Manfred; and Gobel, Wilhelm, to Bayer Aktiengesellschaft. Increasing the molecular weight of a chlorinated polymer of ethylene by treatment with a sulfur compound either before or during chlorination of said polymer. 4,277,579, Cl. 525-344.000.
Beckman, Robert P., to Litton Business Systems, Inc. Furniture joint construction. 4,277,198, Cl. 403-231.000.
Beckmann, Rolf; and Knackstedt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method of manufacturing laminated safety glass. 4,277,538, Cl. 428-429.000.
Beeghly, Bruce R., to Economy Engine Company, The. Integral spark plug coil for automotive-type plug. 4,277,724, Cl. 315-57.000.
Beguwala, Moiz M. E.; and Erdmann, Francis M., to Rockwell International Corporation. Process for direct thermal nitridation of silicon semiconductor devices. 4,277,320, Cl. 204-164.000.
Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, to Siemens Aktiengesellschaft. Method for generating layers on a carrier foil. 4,277,516, Cl. 427-81.000.
Belcher, Donald K.: *See*—
Rosier, Charles D.; Pan, Jing-Jong; and Belcher, Donald K., 4,277,764, Cl. 333-24.00C.
Bell Telephone Laboratories, Incorporated: *See*—
Bartlett, Charles J.; Rhodes, Ronald J.; and Rust, Ray D., 4,277,321, Cl. 204-192.00E.
Brolin, Stephen J.; and Colodner, Samuel, 4,277,647, Cl. 179-6.30R.
Chen, Fang-Shang, 4,277,846, Cl. 455-611.000.
Levinson, Stephen E.; and Pirz, Frank C., 4,277,644, Cl. 179-1.0SD.
Licht, Steven J., 4,277,519, Cl. 427-129.000.
May, Carl J., Jr., 4,277,645, Cl. 179-1.0SC.
Parks, Kenneth B., 4,277,740, Cl. 324-51.000.
Patel, Chandra K. N.; and Tam, Andrew C., 4,276,780, Cl. 73-643.000.
Sampieri, Eugene E.; and Sosnowski, Thomas P., 4,277,783, Cl. 340-708.000.
Sheinbein, Daniel, 4,277,649, Cl. 179-18.00B.
Belyanin, Petr N.: *See*—
Salomatin, Viktor M.; Belyanin, Petr N.; and Pestrikov, Vladimir I., 4,276,727, Cl. 52-115.000.
Bendix Corporation, The: *See*—
Coman, William E.; and Tepolt, Florian E., 4,276,758, Cl. 64-9.00R.
Benjamin, Milton L.; and Miles, Wilbur N., to Erickson Tool Company. Threading attachment. 4,277,209, Cl. 408-139.000.
Beny, Janos: *See*—
Albert, Judith; and Beny, Janos, 4,276,714, Cl. 46-118.000.
Beougher, Gael. Ambulatory apparatus. 4,277,100, Cl. 297-5.000.
Berbalk, Hermann, to Gebruder Boehringer G.m.b.H. Tool machine for machining crankshafts and a method of operation thereof. 4,276,794, Cl. 82-1.00C.
Berendes, Otto; and Vopel, Karl-Heinz, to Bayer Aktiengesellschaft. Process for working up organic reaction mixtures. 4,277,459, Cl. 423-567.00A.
Berg, Christoph: *See*—
Knothe, Erich; Berg, Christoph; and Melcher, Franz J., 4,276,949, Cl. 177-212.000.
Bergeron, Willard. Air and rock particle separator with spiral deflectors. 4,277,263, Cl. 55-282.000.
Bergman, Lee H.: *See*—
Inks, Clyde G.; Compton, John W.; Ellerman, Kathryn M.; and Bergman, Lee H., 4,277,520, Cl. 427-220.000.
Bernardi, Herbert: *See*—
Haberstroh, Markus; and Bernardi, Herbert, 4,276,736, Cl. 53-399.000.
Bertini, Millo. Tap sharpener. 4,276,722, Cl. 51-225.000.
Besserer, Walter: *See*—
Baumann, Manfred; and Besserer, Walter, 4,276,797, Cl. 83-308.000.
Bethlehem Steel Corporation: *See*—
Kwasnoski, Daniel; and Sterner, Charles J., 4,277,311, Cl. 202-183.000.
Betzing, Hans: *See*—
Materne, Carsten; and Betzing, Hans, 4,277,483, Cl. 424-263.000.

Bey, Philippe; Metcalf, Brian W.; and Wiseman, Jeffrey S., to Richardson-Merrell Inc. Novel enzyme inhibitors. 4,277,395, Cl. 260-112.50R.

Bi-Modal Corporation: *See—*
Cripe, Alan R.; and Cripe, Christopher A., 4,276,968, Cl. 188-153.00R.

Bianchi, John E.; and Nichols, Richard D. E., to Bianchi Leather Products, Inc. Front opening holster for pistols. 4,277,007, Cl. 224-193.000.

Bianchi Leather Products, Inc.: *See—*
Bianchi, John E.; and Nichols, Richard D. E., 4,277,007, Cl. 224-193.000.

Bickley Manufacturing Company: *See—*
Witmer, Theodore B., 4,276,983, Cl. 209-587.000.

Bienenstein, Charles A.: *See—*
Turner, Nelson R.; Sanders, Daniel E.; and Bienenstein, Charles A., 4,277,087, Cl. 280-718.000.

Bienz, Robert H.: *See—*
Urick, Palmer D.; and Bienz, Robert H., 4,276,689, Cl. 29-596.000.

Biermann, Kurt; and Reinke, Kurt, to Durkoppwerke GmbH. Welt feeder for sewing machines. 4,276,837, Cl. 112-152.000.

Biggar, Elizabeth Short: *See—*
Biggar, Frank M., III, 4,277,058, Cl. 493-433.000.

Biggar, Frank M., III, to Biggar, Elizabeth Short. Folding apparatus and method for folding a continuous web. 4,277,058, Cl. 493-433.000.

Billig, Ernst: *See—*
Bryant, David R.; and Billig, Ernst, 4,277,627, Cl. 568-454.000.

Bily, Robert R. Addition of lecithin to increase yield of cheese. 4,277,503, Cl. 426-40.000.

Bindra, Jasjit S., to Pfizer Inc. Prostaglandin intermediates. 4,277,403, Cl. 260-343.30P.

Bingham, Allen H., to Kearney-National, Inc. Telescoping tool and coupling means therefor. 4,277,197, Cl. 403-104.000.

Binns, John S.; Braithwaite, Malcolm J.; and Dignum, George, to Lankro Chemicals Limited. Processes for the preparation of chlorinated phenols. 4,277,629, Cl. 568-779.000.

Biron, Raymond J.: *See—*
Peckinpaugh, Frank L.; and Biron, Raymond J., 4,277,430, Cl. 264-129.000.

Birt, David E.; and Holt, Lyn, to E M I Limited. Disc records having surface markings. 4,277,071, Cl. 369-84.000.

Biscop, Francois. Heat-recoverable wrap-around devices. 4,276,909, Cl. 138-167.000.

Bishop, Charles M.: *See—*
Yates, Robert E.; Leonard, John P.; Alongi, Robert E.; Albanes, Wilfredo V.; and Bishop, Charles M., 4,277,038, Cl. 244-3.150.

Bittner, John M., to Ethyl Corporation. Rapid octane rating. 4,276,770, Cl. 73-35.000.

Black & Decker, Inc.: *See—*
Henning, Brian C. R., 4,276,737, Cl. 56-12.800.
Jackson, Ronald A.; and Maruscak, John, 4,277,208, Cl. 408-14.000.
Muehling, Anthony A., 4,276,799, Cl. 83-473.000.
Pioch, Peter P., 4,276,675, Cl. 16-111.00R.

Blackburn, Eugene L. Meter-controlled braking system for a fluid-delivering vehicle. 4,276,998, Cl. 222-30.000.

Blake, Floyd A.; and Northrup, Lynn L., Jr., to Atlantic Richfield Company. Solar system employing ground level heliostats and solar collectors. 4,276,872, Cl. 126-425.000.

Blanning, Robert B.; Treadwell, Archie B.; and Logie, James A., to Martin Marietta Corporation. Method and system for inducing and controlling nutation of a gyroscope. 4,277,039, Cl. 244-3.160.

Blaskowski, Henry J., to Combustion Engineering, Inc. Superheater inlet/outlet header. 4,276,928, Cl. 165-82.000.

Blatnik, Edward F. Liquid level sensor. 4,277,773, Cl. 340-59.000.

Blaupunkt-Werke GmbH: *See—*
Hehr, Wilfried, 4,277,817, Cl. 362-31.000.

Bleiweiss, Arthur F.: *See—*
Urbanek, Karel; and Bleiweiss, Arthur F., 4,277,818, Cl. 362-61.000.

Bliznak, John B.; and Harcarufka, Rudolph E., to Alberto-Culver Company. Sweetener and flavoring compositions and method of producing same. 4,277,511, Cl. 426-548.000.

Bloxham, Roger W. Ballast control system for submersible vessel. 4,276,849, Cl. 114-125.000.

Boardman, Bryan J., to Boardman Energy Systems Incorporated. Heat or cold storage composition containing a hydrated hydraulic cement. 4,277,357, Cl. 252-70.000.

Boardman Energy Systems Incorporated: *See—*
Boardman, Bryan J., 4,277,357, Cl. 252-70.000.

Bochumer Eisenhutte Heintzmann GmbH & Co.: *See—*
Koppers, Manfred; Bohnes, Karlheinz; and Fitzgerald, Harry J., 4,277,204, Cl. 405-288.000.

Bock, Hartmut: *See—*
Kleinschmidt, Willi; and Bock, Hartmut, 4,277,657, Cl. 200-61.210.

Bock, Jan; Makowski, Henry S.; and Lundberg, Robert D., to Exxon Research & Engineering Co. Process for the formation of elastomeric blends of a sulfonated elastomeric polymer. 4,277,381, Cl. 260-23.50A.

Boehringer Ingelheim GmbH: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,277,487, Cl. 424-273.00R.

Boeing Company, The: *See—*
Dunstan, Phillip E.; and McConnell, Charles H., 4,276,976, Cl. 198-334.000.

Boening, John H. Jewelry support. 4,276,757, Cl. 63-1.00R.

Bohachevsky, Ihor O., to United States of America, Energy. Beam heated linear theta-pinch device for producing hot plasmas. 4,277,305, Cl. 176-1.000.

Bohnes, Karlheinz: *See—*
Koppers, Manfred; Bohnes, Karlheinz; and Fitzgerald, Harry J., 4,277,204, Cl. 405-288.000.

Bojsen, Erik M., to F. L. Smidth & Co. Electrostatic precipitator and discharge electrode therefor. 4,277,258, Cl. 55-152.000.

Boliden Aktiebolag: *See—*
Sundkvist, Gustaf J.; Lundgren, Fred O.; Lindberg, Mats-Ove R.; and Bostrom, Erik A., 4,276,777, Cl. 73-864.810.

Bolla, Luciano: *See—*
Audone, Bruno; Bolla, Luciano; and Gerbi, Giuseppe, 4,277,744, Cl. 324-72.000.

Bolldorf, Kurt, to Pfaff Industriemaschinen GmbH. Thread changer for embroidering machines. 4,276,838, Cl. 112-221.000.

Bonin, Werner: *See—*
Sinharay, Akhileswar; Stahler, Gerhard; and Bonin, Werner, 4,277,493, Cl. 424-304.000.

Bonnet, Jean; and Fournet, Julien, to Compagnie Generale des Matieres Nucleaires (COGEMA Groupe C.E.A.). Induction probe for the measurement of magnetic susceptibility. 4,277,750, Cl. 324-201.000.

Bonvallet, Duane J. Acceleration compensated step-in ski bindings. 4,277,084, Cl. 280-629.000.

Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., to U.S. Philips Corporation. Resistance material. 4,277,542, Cl. 338-308.000.

Borken, Richard J., to Honeywell Inc. Low radiation densitometer. 4,277,681, Cl. 250-358.00R.

Bostonian, Edward T. Method and apparatus for converting a ceiling light fixture having a plurality of fluorescent lamps into a single lamp, or two lamp, fixture. 4,277,820, Cl. 362-223.000.

Bostrom, Erik A.: *See—*
Sundkvist, Gustaf J.; Lundgren, Fred O.; Lindberg, Mats-Ove R.; and Bostrom, Erik A., 4,276,777, Cl. 73-864.810.

Bott, John A. Permanent luggage carrier adapters with removable primary luggage carriers. 4,277,009, Cl. 224-309.000.

Boucher, Frederic B.: *See—*
Wahl, Edward F., III; and Boucher, Frederic B., 4,276,748, Cl. 60-641.00D.

Boudot, Jean E.; Roger, Francoise M. M.; and Jeanmaire, Michel P. H., to Corning Glass Works. Sealing glass with high coefficient of absorption for infra-red rays. 4,277,285, Cl. 106-52.000.

Bouwknegt, Albert: *See—*
Couwenberg, Winston D.; Bouwknegt, Albert; Ligthart, Franciscus A. S.; and Heuvelmans, Jean J., 4,277,720, Cl. 313-485.000.

Boyce, Jay, to Jay Boyce & Associates. Energy controller for conversion from a direct current source to a variable frequency load. 4,277,736, Cl. 318-811.000.

Boyd, David C.; and Thompson, David A., to Corning Glass Works. Lead-free glasses of high x-ray absorption for cathode ray tubes. 4,277,286, Cl. 106-52.000.

Braithwaite, Malcolm J.: *See—*
Binns, John S.; Braithwaite, Malcolm J.; and Dignum, George, 4,277,629, Cl. 568-779.000.

Brammall, Inc.: *See—*
Van Gompel, James J., 4,277,211, Cl. 410-47.000.

Branden, Leif; Bruun, Jan F.; Holm, Olle; Mellgren, Ronnie E.; Ryr, Karl A.; Stromer, Carl-Axel; and Tronslien, Erling, to Telefonaktiebolaget L M Ericsson. Fastening arrangement in a telephone instrument. 4,277,652, Cl. 179-100.00D.

Braun, Wolfgang; and Irion, Leonhard, to Kraftwerk Union Ag. Water-cooled nuclear reactor. 4,277,310, Cl. 176-50.000.

Bregulla, Eduard; Chrubasik, Alfred; and Vietzke, Horst, to Nukem G.m.b.H. Furnace for incineration of nuclear fission and fertile material waste particularly plutonium and uranium containing organic waste. 4,276,834, Cl. 110-237.000.

Bretzinger, Dieter: *See—*
Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, 4,277,418, Cl. 260-465.400.

Brindley, Donald J. Calendar apparatus. 4,276,703, Cl. 40-121.000.

Bristol-Myers Company: *See—*
Buyniski, Joseph P.; Hooper, John W.; and Lim, Gary M. F., 4,277,605, Cl. 546-74.000.

British Broadcasting Corporation: *See—*
Chambers, John P., 4,277,838, Cl. 365-222.000.

British Leyland UK Limited: *See—*
Burnett, Stanley F.; Dunkley, Michael; Grimes, Raymond M.; and Parmee, Keith, 4,276,972, Cl. 192-4.00C.

Broellos, Klaus: *See—*
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,277,315, Cl. 203-51.000.

Broerman, Arthur B., to Phillips Petroleum Company. Fluid actuated valve. 4,276,907, Cl. 137-637.200.

Brois, Stanley J.; Ryer, Jack; and Winans, Esther D., to Exxon Research & Engineering Co. Oil-soluble hydrocarbyl substituted 1-aza-3,7-dioxabicyclo[3.3.0]oct-5-yl methyl alcohols, as additives for functional fluids. 4,277,354, Cl. 252-51.50R.

Brois, Stanley J.: *See—*
Deen, Harold E.; O'Halloran, Rosemary; Winans, Esther D.; Ryer, Jack; and Brois, Stanley J., 4,277,353, Cl. 252-51.50R.

Brolin, Stephen J.; and Colodner, Samuel, to Bell Telephone Laboratories, Incorporated. Coin signaling system. 4,277,647, Cl. 179-6.30R.

Brook, Edward E. Floor wax stripping apparatus. 4,276,673, Cl. 15-49.00C.

Brookdeal Electronics Limited: *See*—
Faulkner, Eric A., 4,277,753, Cl. 328-26.000.

Brookes, Ronald R., to TRW Inc. Plug mold assembly. 4,276,922, Cl. 164-27.000.

Bross, Robert. Handgun stock pommel. 4,276,709, Cl. 42-71.00P.

Brother Industries, Ltd.: *See*—
Nakai, Toshio; Kuzuya, Susumu; Onoda, Hiroshi; Iwase, Takayuki; and Asai, Akira, 4,277,192, Cl. 400-671.000.

Broughton, Alan, to Nichols Institute. Mammalian Somatomedin measurement. 4,277,249, Cl. 23-230.00B.

Brown, David J.; Walther, Ronald G.; Williams, Thomas W.; and Wrigglesworth, Michael D., to International Business Machines Corporation. Latch circuit operable as a D-type edge trigger. 4,277,699, Cl. 307-272.00R.

Brown, John B. Butter melter device for toaster. 4,276,821, Cl. 99-339.000.

Brown, Neil L.: *See*—
Lawson, Kenneth D.; and Brown, Neil L., 4,277,751, Cl. 324-254.000.

Brown, Ronald D.: *See*—
Tolman, Richard L.; Ashton, Wallace T.; and Brown, Ronald D., 4,277,603, Cl. 544-250.000.

Browning, Jesse H. Powder collectors. 4,277,260, Cl. 55-273.000.

Bruce, Charles W., to United States of America, Army. Resonant subcavity differential spectrophone. 4,277,179, Cl. 356-433.000.

Bruun, Jan F.: *See*—
Branden, Leif; Bruun, Jan F.; Holm, Olle; Mellgren, Ronnie E.; Ryr, Karl A.; Stromer, Carl-Axel; and Tronslien, Erling, 4,277,652, Cl. 179-100.00D.

Bryansky, Jury A.; Gess de Kalve, Stanislav B.; and Ermilin, Igor V. Transport vehicle. 4,277,085, Cl. 280-660.000.

Bryant, David R.; and Billig, Ernst, to Union Carbide Corporation. Hydroformylation process. 4,277,627, Cl. 568-454.000.

Bubley, Henry J.; and Oltra, Claude H., to American Screen Printing Equipment Company. Squeegee and flood bar actuator. 4,276,826, Cl. 101-123.000.

Buchholz, Kenneth M.; and Le Maire, Henry T., to Schomann, Inc. Filter cleaning arrangement. 4,277,264, Cl. 55-294.000.

Bugaut, Andree; and Andrillon, Patrick, to Societe Anonyme dite: L'Oreal. Dye compositions for keratinic fibers containing paraphenylenediamines. 4,277,244, Cl. 8-410.000.

Bulidon, Jacques; and Pavan, Charles, to Roussel Uclaf. Process for the preparation of 4-chloroquinolines. 4,277,607, Cl. 546-179.000.

Bulidon, Jacques: *See*—
Pavan, Charles; and Bulidon, Jacques, 4,277,408, Cl. 260-397.100.

Bullock, Robert L., to Standard Car Truck Company. Railway truck friction stabilizing assembly. 4,276,833, Cl. 105-197.0DB.

Bundy, Gordon L., to Upjohn Company, The. ω-Aryl-9-deoxy-9-methylene-5,6-didehydro-PGF_1 compounds. 4,277,612, Cl. 560-55.000.

Bunker Ramo Corporation: *See*—
Schrott, Werner G.; and Wodok, Hans, 4,277,135, Cl. 350-96.210.

Burg, Karlheinz; Schmieder, Werner; and Wolters, Ernst, to Hoechst Aktiengesellschaft. Thermoplastic molding compositions on the basis of oxymethylene polymers. 4,277,577, Cl. 525-154.000.

Burgeson, John E.; and Lieurance, Dennis W., to General Dynamics Corporation. Superconducting magnetic coil. 4,277,768, Cl. 335-216.000.

Burke, Robert V., to Litton Systems, Inc. Solid-state ballast for rapid-start type fluorescent lamps. 4,277,726, Cl. 315-98.000.

Burlew, Michele M.: *See*—
Madsen, Ernest L.; Zagzebski, James A.; Banjavic, Richard A.; and Burlew, Michele M., 4,277,367, Cl. 252-408.000.

Burnett, Stanley F.; Dunkley, Michael; Grimes, Raymond M.; and Parmee, Keith, to British Leyland UK Limited. Method of, and apparatus for, retarding the motion of a power driven vehicle. 4,276,972, Cl. 192-4.00C.

Burnham, Robert D.: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,277,762, Cl. 331-94.50H.

Burns, William A.: *See*—
Hancock, Robert J.; Burns, William A.; and Hall, James B., 4,277,844, Cl. 371-38.000.

Burrell, Bruce: *See*—
Saltzman, Robert N.; and Burrell, Bruce, 4,276,751, Cl. 62-138.000.

Burroughs Wellcome Co.: *See*—
Copp, Frederick C.; Collard, David; and Denyer, Clive V., 4,277,498, Cl. 424-320.000.

Burrows, Thomas W.; and Cavil, David T., to Outboard Marine Corporation. Capacitor discharge ignition system having automatic spark advance. 4,276,868, Cl. 123-602.000.

Busch, Josef: *See*—
Gref, Hans; Hofmann, Hans; Zander, Werner; and Busch, Josef, 4,276,853, Cl. 118-643.000.

Buschmann, Horst, to Schloemann-Siemag Aktiengesellschaft. Slab cooling and conveying apparatus. 4,276,979, Cl. 198-775.000.

Bush Boake Allen Limited: *See*—
Webb, David; and Mills, Anthony J., 4,277,377, Cl. 252-522.00R.

Buyniski, Joseph P.; Hooper, John W.; and Lim, Gary M. F., to Bristol-Myers Company. Chemical compounds. 4,277,605, Cl. 546-74.000.

Buzzell, James M., to Centronics Data Computer Corp. Paper roll holder with dancer bar for use with printers and the like. 4,277,034, Cl. 242-67.30R.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Amschler, Hermann, 4,277,472, Cl. 424-248.500.

Cadotte, John E., to FilmTec Corporation. Interfacially synthesized reverse osmosis membrane. 4,277,344, Cl. 210-654.000.

Calabrese, Richard A., to Pitney Bowes, Inc. Cleaner for pressure fixing roller. 4,277,161, Cl. 355-3.0FU.

Calderon, Reynaldo, to Texaco Inc. Methods for cleaning a helical spring filter. 4,277,348, Cl. 210-791.000.

Caldo, Cornelio; and Basili, Luigi, to Montedison S.p.A. Catalyst-forming components, process for preparing same, and catalysts for stereospecifically polymerizing olefins prepared therefrom. 4,277,371, Cl. 252-429.00B.

Calhoun, Michael B.; Bayh, Russell I., III; and Dutton, Robert E., to Otis Engineering Corporation. Well safety system. 4,276,937, Cl. 166-323.000.

Callahan, Arthur C.: *See*—
Andrews, James P.; Callahan, Arthur C.; and Gendy, Moheb M., 4,277,290, Cl. 134-10.000.

Callahan, David K. Portable in-line press. 4,276,685, Cl. 29-252.000.

Capurka, Zbynek A., to Motorola, Inc. Apparatus for the generation of monostable pulses having predetermined durations independent of input signal period. 4,276,860, Cl. 123-415.000.

Carl Freudenberg, Firma: *See*—
Forch, Hans, 4,277,072, Cl. 277-65.000.
Ticks, Gerd-Heinz, 4,277,056, Cl. 267-140.100.

Carlson, George M.; and O'Hagan, Michael, to Texas Instruments Incorporated. Microprocessor based system for the development and emulation of programmable calculator control read only memory software. 4,277,827, Cl. 364-200.000.

Carlson, Roland W.: *See*—
Covic, John; Leininger, Glen; and Carlson, Roland W., 4,277,685, Cl. 250-445.00T.

Carnahan, James C., to General Electric Company. Phenol recovery from bisphenol-A waste streams. 4,277,628, Cl. 568-749.000.

Caroselli, Frank E.: *See*—
Sibrava, Joseph S.; and Caroselli, Frank E., 4,276,982, Cl. 206-439.000.

Carroll, Howard E.; and Sweitzer, Gerald M., to SCM Corporation. High PVC latex paint. 4,277,385, Cl. 260-29.6RW.

Carson, Arthur N., to U.S. Philips Corporation. X-Ray collimator, particularly for use in computerized axial tomography apparatus. 4,277,684, Cl. 250-445.00T.

Cartwright, Frederick D. Erosion potential determinations. 4,276,767, Cl. 73-7.000.

Caruso, Michael J.: *See*—
Mar, Clarence Y.; and Caruso, Michael J., 4,277,675, Cl. 235-92.0MB.

Casler, William A.; and Saurenman, Phillip E., to Clamp Manufacturing Co., Inc. Clamping means and tool for making it. 4,276,692, Cl. 30-347.000.

Casper, William L.; Jordon, Michael A.; Caulkins, Craig S.; and Miller, Robert G., to Liftech Consultants, Inc. Method of constructing and erecting a dome-shaped structure. 4,276,733, Cl. 52-745.000.

Castle Kee[illegible], Inc.: *See*—
Hunyadi, Steve, 4,277,781, Cl. 340-545.000.

Caterpillar Tractor Co.: *See*—
Kuhfuss, Alvin L., Jr.; and Riediger, Craig W., 4,276,952, Cl. 180-294.000.
Langenstein, Joseph G., 4,276,786, Cl. 74-491.000.
Livesay, Richard E., 4,277,199, Cl. 403-317.000.

Caulkins, Craig S.: *See*—
Casper, William L.; Jordon, Michael A.; Caulkins, Craig S.; and Miller, Robert G., 4,276,733, Cl. 52-745.000.

Cavanagh, Patrick E., to Maghemite Inc. Induction belt separation. 4,277,329, Cl. 209-212.000.

Cavil, David T.: *See*—
Burrows, Thomas W.; and Cavil, David T., 4,276,868, Cl. 123-602.000.

Cavileer, Watson V. Irrigation valve. 4,277,046, Cl. 251-312.000.

Celanese Corporation: *See*—
Jaarsma, Frank C., 4,277,000, Cl. 222-142.400.

Centro Ricerche Fiat S.p.A.: *See*—
Paolasini, Sergio, 4,277,376, Cl. 252-455.00R.

Centronics Data Computer Corp.: *See*—
Buzzell, James M., 4,277,034, Cl. 242-67.30R.
Howard, Robert; Robinson, Prentice; and Vitale, Alexander F., 4,277,189, Cl. 400-320.000.

Cerofolini, Gianfranco; and Ferla, Giuseppe, to SGS-ATES Componenti Elettronici S.p.A. Process for making CMOS field-effect transistors. 4,277,291, Cl. 148-1.500.

Ceserani, Roberto: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,277,491, Cl. 424-285.000.

Chambers, John P., to British Broadcasting Corporation. Data receiving apparatus. 4,277,838, Cl. 365-222.000.

Chambers, Richard F.; and Rachima, Nissim, to Olin Corporation. Process for reducing calcium ion concentrations in alkaline alkali metal chloride brines. 4,277,447, Cl. 423-165.000.

Chambley, Phillip W.; and Norris, Alan H., to WWG Industries, Inc. Self-twisted yarn and method and apparatus for producing it. 4,276,740, Cl. 57-205.000.

Champion International Corporation: *See*—
Austin, John J., 4,277,506, Cl. 426-111.000.
Webinger, George, 4,277,014, Cl. 229-11.000.

Chao, Robert L., to Supertex, Inc. Detection circuit and structure therefor. 4,277,782, Cl. 340-661.000.

Chapin, Lawrey H.; and Maze, Robert O., to Honeywell Inc. Electric induction field navigation apparatus. 4,277,771, Cl. 340-27.0NA.

Charles, John J., to GAF Corporation. Durable polyester molding composition and product. 4,277,391, Cl. 260-40.00R.

Chase, Marshall D. Pistol receiver actuating mechanism. 4,276,708, Cl. 42-44.000.

Chemie Linz Aktiengesellschaft: *See—*
Czepel, Hubert; Jilek, Franz; and Zochbauer, Heinz, 4,277,532, Cl. 428-244.000.

Chen, Fang-Shang, to Bell Telephone Laboratories, Incorporated. Circuit for stabilizing the output of an injection laser. 4,277,846, Cl. 455-611.000.

Chen, Wu. Mechano-electrostatic charge-imaging method and apparatus. 4,276,829, Cl. 101-426.000.

Cherenko, Joseph; Frey, William I.; Kelly, Joseph D.; and Sokol, Larry S., to PPG Industries, Inc. Release molds for laminating bilayer safety glass. 4,277,299, Cl. 156-242.000.

Cherry Electrical Products Corp.: *See—*
Lewandowski, Raymond, 4,277,662, Cl. 200-242.000.

Chia, E. Henry: *See—*
Weber, John G.; and Chia, E. Henry, 4,277,281, Cl. 75-93.00R.

Child, Edward T.: *See—*
Paull, Peter L.; and Child, Edward T., 4,277,365, Cl. 252-373.000.

Chin, Robert W.; and Krause, Walter J., to Goodyear Aerospace Corporation. Method and means for fastening friction wear pads. 4,276,969, Cl. 188-218.0XL.

Chinushi, Kiyoto: *See—*
Mitsunaga, Takayoshi; Chinushi, Kiyoto; and Umezu, Tadashi, 4,277,488, Cl. 424-273.00R.

Chiodo, Morvan. Pressure cooker with seal safety relief. 4,276,990, Cl. 220-209.000.

Chisholm-Ryder Co., Inc.: *See—*
Ferraro, Dominick, 4,276,738, Cl. 56-130.000.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Wakabayashi, Ataru; and Masuhara, Isao, 4,277,451, Cl. 423-243.000.

Chleck, David J.: *See—*
Kovac, Michael G.; Chleck, David J.; and Goodman, Philip, 4,277,742, Cl. 324-61.00R.

Choi, Sam Kwon; and Lee, Kee Dong, to Sunkyong Fibers, Ltd. Antistatic agents, synthesis and use thereof. 4,277,584, Cl. 525-437.000.

Chrisman, Max G., to Owens-Corning Fiberglas Corporation. Process for controlling molten glass variables. 4,277,274, Cl. 65-29.000.

Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., to Merck & Co., Inc. 3-Substituted thio-6-amido-7-oxo-1-azabicyclo[3.2.0]-hept-2-ene-2-carboxylic acid s-oxides. 4,277,482, Cl. 424-263.000.

Christensen, Charles R.: *See—*
Smith, James L.; and Christensen, Charles R., 4,277,127, Cl. 350-3.670.
Upatnieks, Juris; Christensen, Charles R.; and Guenther, Bobby D., 4,277,137, Cl. 350-162.0SF.

Christensen, Donald R.; and Stanford, Ralph F., to King-Seeley Thermos Co. Ice dispensing mechanism. 4,277,002, Cl. 222-349.000.

Christoffel, Julius M., Jr., to Damon Corporation. Kite strut connector. 4,277,040, Cl. 244-153.00R.

Chriswell, Colin D.: *See—*
Oulman, Charles S.; and Chriswell, Colin D., 4,277,635, Cl. 568-916.000.

Chrubasik, Alfred: *See—*
Bregulla, Eduard; Chrubasik, Alfred; and Vietzke, Horst, 4,276,834, Cl. 110-237.000.

Ciba-Geigy AG: *See—*
Whitear, Brian R. D., 4,277,398, Cl. 260-162.000.

Ciba-Geigy Corporation: *See—*
Farooq, Saleem; Ackermann, Peter; Drabek, Jozef; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,277,494, Cl. 424-305.000.
Garner, Robert; and Whitehead, Michael J., 4,277,400, Cl. 260-326.13B.
Keller, Karlheinz; and Furer, Lotti, 4,277,247, Cl. 8-557.000.
Lawrence, Simon G.; and Hossack, James, 4,277,288, Cl. 106-309.000.
Mueller, Karl F.; and Good, William R., 4,277,582, Cl. 525-421.000.
Reinehr, Dieter; and Pfeifer, Josef, 4,277,621, Cl. 564-250.000.
Rosen, Melvin H., 4,277,484, Cl. 424-267.000.
Zahner, Hans; Drautz, Hannelore; and Keller, Walter, 4,277,478, Cl. 424-258.000.

Citizen Watch Co., Ltd.: *See—*
Sekiya, Fukuo; and Yamada, Takashi, 4,277,840, Cl. 368-71.000.

CKD Corporation: *See—*
Konno, Toshio; and Hayakawa, Masatoshi, 4,276,683, Cl. 29-25.420.

Claassens, Jacobus M. M.; van der Leeuw, Bart; and van Elderen, Nicolaas F., to U.S. Philips Corporation. Electric gas discharge lamp. 4,277,715, Cl. 313-220.000.

Clamp Manufacturing Co., Inc.: *See—*
Casler, William A.; and Saurenman, Phillip E., 4,276,692, Cl. 30-347.000.

Clark, Ralph E.: *See—*
Mehra, Yuv R.; and Clark, Ralph E., 4,277,313, Cl. 203-32.000.

Clarke, John T.: *See—*
Luck, Allan J.; Clarke, John T.; and Sutton, Roger F., 4,277,428, Cl. 264-118.000.

Clausen, Donald A. Lift structure for servicing vehicles. 4,277,049, Cl. 254-91.000.

Clegg, John E. Conical split-image microscopic lens. 4,277,148, Cl. 350-432.000.

Cly-Del Manufacturing Company, The: *See—*
L'Allemand, Charles C., 4,277,298, Cl. 156-199.000.

Coal Industry (Patents) Limited: *See—*
Davison, Joseph A.; Hall, Graham W.; Hodges, Newton J.; and Price, David W., 4,277,568, Cl. 521-68.000.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of 2,6,10-trimethyl-undecan-1-ol. 4,277,610, Cl. 556-446.000.

Coleman, Jess A. Underwater cruise device. 4,276,851, Cl. 114-313.000.

Collard, David: *See—*
Copp, Frederick C.; Collard, David; and Denyer, Clive V., 4,277,498, Cl. 424-320.000.

Collins, Robert W.; Hoffman, Roy L.; Loen, Larry W.; Mitchell, Glen R.; and Soltis, Frank G. Synchronizing mechanism for page replacement control. 4,277,826, Cl. 364-200.000.

Colodner, Samuel: *See—*
Brolin, Stephen J.; and Colodner, Samuel, 4,277,647, Cl. 179-6.30R.

Colombo, Antonio, to SGS-ATES Componenti Elettronici S.p.A. Voltage limiter for flyback generator of television sweep system. 4,277,730, Cl. 315-408.000.

Colt Industries Operating Corp: *See—*
Smitley, Marion L., 4,276,951, Cl. 180-165.000.

Coman, William E.; and Tepolt, Florian E., to Bendix Corporation, The. Fail safe redundant drive shaft apparatus including electrically operative failure detection means. 4,276,758, Cl. 64-9.00R.

Combustion Engineering, Inc.: *See—*
Blaskowski, Henry J., 4,276,928, Cl. 165-82.000.

Comeau, Paul E., to Kenney Manufacturing Company. Traverse rod and support combination. 4,276,920, Cl. 160-345.000.

Commissariat a l'Energie Atomique: *See—*
Duhayon, Jacques; Goumondy, Jean-Pierre; Leudet, Alain; and Rousseau, Jean-Claude, 4,277,363, Cl. 252-301.10W.
Madelaine, Guy; and Pourprix, Michel, 4,277,682, Cl. 250-380.000.

Commodore Electronics Limited: *See—*
Hyltin, Tom M., 4,277,784, Cl. 340-711.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Holan, George; and Walser, Reimund A., 4,277,490, Cl. 424-282.000.

Compagnie Francaise des Petroles: *See—*
Archambaud, Denis G.; and Dermy, Rene M., 4,277,202, Cl. 405-169.000.

Compagnie Generale des Matieres Nucleaires (COGEMA Groupe C.E.A.): *See—*
Bonnet, Jean; and Fournet, Julien, 4,277,750, Cl. 324-201.000.

Compagnie Industrielle Radioelectrique: *See—*
Grosvernier, Claude-Arnold, 4,277,176, Cl. 356-394.000.

Compton, John W.: *See—*
Inks, Clyde G.; Compton, John W.; Ellerman, Kathryn M.; and Bergman, Lee H., 4,277,520, Cl. 427-220.000.

Compu-Pic Incorporated: *See—*
Newman, Thomas M., 4,277,064, Cl. 273-138.00A.

Conageski, Raymond H., to Du Pont de Nemours, E. I., and Company. One-stage flotation purification of NaOH. 4,277,331, Cl. 23-293.00R.

Congoleum Corporation: *See—*
Kaminski, Stanley; Mansolillo, Robert D.; and Wilmer, Eugene A., 4,277,427, Cl. 264-45.500.

Conoco, Inc.: *See—*
Dudt, Philip J., 4,277,252, Cl. 23-313.00R.
Spangler, Carl D., Jr., 4,277,268, Cl. 62-26.000.

Continental Group, Inc., The: *See—*
Hansen, Everett T., 4,276,843, Cl. 113-1.00F.
Hasegawa, Gary K., 4,276,993, Cl. 220-269.000.

Contraves AG: *See—*
Guggenbuhl, Walter, 4,277,743, Cl. 324-71.0CP.

Control Concepts, Inc.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,276,810, Cl. 91-449.000.
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,276,811, Cl. 91-449.000.

Convers, Alain: *See—*
Courty, Philippe; Miquel, Jean; Martino, Germain; and Convers, Alain, 4,277,369, Cl. 252-415.000.

Conway, Gerald A. Injection molding resilient ring clip. 4,277,434, Cl. 264-297.000.

Copp, Frederick C.; Collard, David; and Denyer, Clive V., to Burroughs Wellcome Co. Amides. 4,277,498, Cl. 424-320.000.

Coppola, Peter J. Portable water filtration system. 4,277,333, Cl. 210-136.000.

Coral Chemical Company: *See—*
Tupper, George L., 4,277,292, Cl. 148-6.270.

Cordes, Claus: *See—*
Straub, Ferdinand; Spoor, Herbert; and Cordes, Claus, 4,277,576, Cl. 525-123.000.

Corman, Edward M.: *See—*
Balzer, Claude P.; and Corman, Edward M., 4,276,728, Cl. 52-177.000.

Cornell Research Foundation, Inc.: *See—*
Hayes, Thomas D.; and Jewell, William J., 4,277,342, Cl. 210-609.000.

Corning Glass Works: *See—*
Boudot, Jean E.; Roger, Francoise M. M.; and Jeanmaire, Michel P. H., 4,277,285, Cl. 106-52.000.
Boyd, David C.; and Thompson, David A., 4,277,286, Cl. 106-52.000.
Dorfeld, William G., 4,277,522, Cl. 427-292.000.

Kane, William T., 4,277,322, Cl. 204-195.00S.

Courty, Philippe; Miquel, Jean; Martino, Germain; and Convers, Alain, to Institut Francais du Petrole. Regeneration of a catalyst for aromatic hydrocarbons steam dealkylation. 4,277,369, Cl. 252-415.000.

Courty, Philippe: *See*—
Sugier, Andre; Courty, Philippe; Deschamps, Andre; and Gruhier, Henri, 4,277,458, Cl. 423-437.000.

Couttet, Andre: *See*—
Eranian, Armand; Dubois, Jean-Claude; Couttet, Andre; and Datamanti, Evelyne, 4,277,554, Cl. 430-270.000.

Couwenberg, Winston D.; Bouwknegt, Albert; Ligthart, Franciscus A. S.; and Heuvelmans, Jean J., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,277,720, Cl. 313-485.000.

Covic, John; Leininger, Glen; and Carlson, Roland W., to Ohio-Nuclear, Inc. Adjustable collimator. 4,277,685, Cl. 250-445.00T.

Cox, Michael. Sculptured optical art form. 4,277,139, Cl. 350-286.000.

CPC International Inc.: *See*—
Yahl, Kenneth R., 4,277,411, Cl. 260-412.400.

Cragoe, Edward J., Jr.: *See*—
Woltersdorf, Otto W.; and Cragoe, Edward J., Jr., 4,277,602, Cl. 544-207.000.

Crane, Walton B., to Industrial Designs & Services. Container for produce and the like having releasably securable flaps. 4,277,015, Cl. 229-23.00C.

Cranfield Institute of Technology: *See*—
Dinsdale, Jack; Parkins, David W.; and Hardwick, John P., 4,277,070, Cl. 369-248.000.

Crawford, Thomas J.: *See*—
Rodriguez, Luis F.; and Crawford, Thomas J., 4,277,680, Cl. 250-358.00R.

Creusot-Loire: *See*—
Lefebvre, Jean-Pierre, 4,276,668, Cl. 9-2.00A.
Zanetta, Hugues, 4,277,054, Cl. 266-268.000.

Cripe, Alan R.; and Cripe, Christopher A., to Bi-Modal Corporation. Rail car brake system. 4,276,968, Cl. 188-153.00R.

Cripe, Christopher A.: *See*—
Cripe, Alan R.; and Cripe, Christopher A., 4,276,968, Cl. 188-153.00R.

Crosbie, Scott C. Percolating bubble generator. 4,276,713, Cl. 46-8.000.

Crottaz, Roland: *See*—
Henggeler, Aldo; and Crottaz, Roland, 4,276,731, Cl. 52-484.000.

Crow, Joseph W.: *See*—
Giachino, Joseph M.; Haeberle, Russell J.; and Crow, Joseph W., 4,277,814, Cl. 361-283.000.

Crow, Morgan L., to Dresser Industries, Inc. Axial compression positive rock bit seal. 4,277,109, Cl. 308-8.200.

Crowley, Ralph P., to Phillips Petroleum Company. Storage system for liquefied gases. 4,276,749, Cl. 62-51.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Fausone, Alfredo; and Seano, Vittorio, 4,277,755, Cl. 330-128.000.
Garibotto, Giovanni, 4,277,834, Cl. 364-724.000.

Cull, Neville L.: *See*—
Sawyer, Willard H.; and Cull, Neville L., 4,277,373, Cl. 252-437.000.

Cummins Engine Company, Inc.: *See*—
Lauterbach, Jerre F., 4,277,116, Cl. 308-188.000.
Reid, David L.; and Taylor, Dennis O., 4,277,830, Cl. 364-431.000.

Cupitt, Larry T.: *See*—
Morgan, Robert L.; Cupitt, Larry T.; and Gamble, William L., 4,277,146, Cl. 350-356.000.

Cushing, Charles J.; Phillips, Clifton W.; and VanderNeut, Richard D., to Ford Aerospace & Communications Corp. Web element concentration detection system. 4,277,178, Cl. 356-431.000.

Cusimano, Richard J.: *See*—
Fisher, Theodore H., II; and Cusimano, Richard J., 4,277,651, Cl. 179-90.00B.

Cussons, Frank M.: *See*—
Williams, Thomas A.; and Cussons, Frank M., 4,277,455, Cl. 423-321.00S.

Cyloflex, Inc.: *See*—
Lovas, Joseph R.; Lovas, Paul J.; and Koelmel, Carl F., 4,276,693, Cl. 30-380.000.

Czepel, Hubert; Jilek, Franz; and Zochbauer, Heinz, to Chemie Linz Aktiengesellschaft. Thermally expandable sealants. 4,277,532, Cl. 428-244.000.

D.E.J. International Research Company B.V.: *See*—
Wouda, Hermanus A. J., 4,277,509, Cl. 426-387.000.

Dabrowski, Ralf, to Hans Kramer GmbH & Co. KG, Firma. Mineral substance based on a reversibly swellable tri-laminar mineral developed to be crystalline over a large area and having crystal layers separated from one another. 4,277,456, Cl. 423-328.000.

Dadachanji, Fali M. Relates to apparatus for measuring the dew point. 4,276,768, Cl. 73-17.00A.

Daguet, Jacques L.: *See*—
Duquenne, Michel G. A.; David, Guy A. J.; Grima, Jean-Claude; and Daguet, Jacques L., 4,277,843, Cl. 370-84.000.

Dai Nippon Toryo Co., Ltd: *See*—
Hayashi, Masaaki; Nagami, Koichi; Tsuneta, Kazuyoshi; and Kenmotusu, Nobuhiro, 4,277,383, Cl. 260-29.300.

Daiichi Radioisotope Laboratories, Ltd.: *See*—
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,277,460, Cl. 424-1.000.
Sakakibara, Shumpei; Kumahara, Yuichi; Okada, Yoshiaki; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tsushima, Shoichiro, 4,277,393, Cl. 260-112.50R.

Daimler-Benz Aktiengesellschaft: *See*—
Klein, Wilhelm; Bausch, Max; and Eckert, Dieter, 4,277,099, Cl. 296-146.000.

Dainippon Ink & Chemicals Inc.: *See*—
Asada, Touru; Miura, Yasuhisa; and Yoshino, Tsutomu, 4,277,622, Cl. 564-512.000.

Dammann, Hans, to U.S. Philips Corporation. Diffraction grating and system for the formation of color components. 4,277,138, Cl. 350-162.00R.

Damon Corporation: *See*—
Christoffel, Julius M., Jr., 4,277,040, Cl. 244-153.00R.

Dangschat, Rainer; Jeschke, Alfred; Leichtl, Helmut; and Winkler, Wolfgang, to Siemens Aktiengesellschaft. Color television receiver having an automatic adjustment system and a process for adjusting the receiver. 4,277,797, Cl. 358-21.00R.

Daniel, John K.; and Peet, Norton P., to Dow Chemical Company, The. Novel 4-bis((Phenylmethyl)amino)-benzenesulfonic acids possessing antiviral activity. 4,277,492, Cl. 424-304.000.

Dantlgraber, Jorg, to G. L. Rexroth GmbH. Radial piston pump. 4,277,228, Cl. 417-273.000.

Datamanti, Evelyne: *See*—
Eranian, Armand; Dubois, Jean-Claude; Couttet, Andre; and Datamanti, Evelyne, 4,277,554, Cl. 430-270.000.

Datascope Corp.: *See*—
Wolvek, Sidney; and Hanson, Bruce L., 4,276,874, Cl. 128-1.00D.

Dauben, William G.; Baskin, Craig P.; and vanRiel, Herman C. H. A., to United States of America, Health and Human Services. Facile synthesis of codeine precursors from thebaine. 4,277,604, Cl. 546-44.000.

Daugulis, Khubert L.: *See*—
Sika, Zigurd K.; Apsit, Voldemar V.; Daugulis, Khubert L.; and Kurkalov, Ivan I., 4,276,832, Cl. 104-292.000.

David, Guy A. J.: *See*—
Duquenne, Michel G. A.; David, Guy A. J.; Grima, Jean-Claude; and Daguet, Jacques L., 4,277,843, Cl. 370-84.000.

Davidson, John C.: *See*—
Anderson, John L.; Davidson, John C.; Schaaf, Henry W.; and Meis, Charles H., 4,277,023, Cl. 239-11.000.

Davis, Brian L. Open-ended wrench having ratcheting action. 4,276,790, Cl. 81-111.000.

Davis, Glenn W.; and Fleek, Arthur E., to International Business Machines Corporation. Printer system having microprocessor control. 4,277,191, Cl. 400-582.000.

Davis, Luther, Jr., to Raytheon Company. Dynamically focussed array. 4,276,779, Cl. 73-626.000.

Davis, Walter Z.: *See*—
Sonderman, Ed L.; and Davis, Walter Z., 4,277,780, Cl. 340-365.00S.

Davison, Joseph A.; Hall, Graham W.; Hodges, Newton J.; and Price, David W., to Coal Industry (Patents) Limited. Sealant material. 4,277,568, Cl. 521-68.000.

Daye, Leslie G. Closed circuit heating system. 4,277,021, Cl. 237-56.000.

DBS, Inc.: *See*—
Thomson, Morton W., 4,276,825, Cl. 101-45.000.

Decker, Harry J.; and Thorsteinson, Erlind M., to Union Carbide Corporation. Catalytic oxide of molybdenum, vanadium, tantalum and optional 4th metal. 4,277,375, Cl. 252-455.00R.

Deen, Harold E.; O'Halloran, Rosemary; Winans, Esther D.; Ryer, Jack; and Brois, Stanley J., to Exxon Research & Engineering Co. Oil-soluble substituted mono and bicyclic oxazolidines, their preparation and use as additives for functional fluids. 4,277,353, Cl. 252-51.50R.

Deere & Company: *See*—
Bass, Merlyn D.; and Demorest, Donald W., 4,276,814, Cl. 92-23.000.
Hunck, Billie G.; and Nelson, Robert W., 4,276,896, Cl. 137-101.000.

de Fasselle, Robert J.; Baron, Richard D.; and Nottke, James E., to Lykes Pasco Packing Company. Rotary filling and capping apparatus. 4,276,734, Cl. 53-77.000.

De Groff, James T.: *See*—
Feldman, Martin L.; and De Groff, James T., 4,277,392, Cl. 260-40.00R.

Deguchi, Masanobu; and Ikegami, Takeshi, to Sharp Kabushiki Kaisha. Sheet conveyor for use in copying machines. 4,276,978, Cl. 198-654.000.

Deichert, William G.; Niu, Gregory C.; and VanBuren, Martin F., to Bausch & Lomb Incorporated. Water absorbing contact lenses made from polysiloxane/acrylic acid polymer. 4,277,595, Cl. 528-26.000.

Delp, Hermann; and Muller, Norbert, to General Motors Corporation. Steering column switch assembly. 4,277,658, Cl. 200-61.540.

Demmin, Timothy R.; and Rogic, Milorad M., to Allied Chemical Corporation. Preparation of muconic acid mononitriles and copper-(II)-ammonia reagent therefor. 4,277,419, Cl. 260-465.400.

Demorest, Donald W.: *See*—
Bass, Merlyn D.; and Demorest, Donald W., 4,276,814, Cl. 92-23.000.

Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Teche, Andre, 4,277,617, Cl. 560-124.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Kagami, Toshio; Saito, Yoshijiro; Matsushita, Shigeru; and Iriuchijima, Kunio, 4,277,388, Cl. 260-33.40R.

Deno, Don W., to Electric Power Research Institute, Inc. Personal electric field exposure monitor. 4,277,745, Cl. 324-72.000.

Dent, Thomas H.; Jordan, Diane E.; King, William E.; and Rieger, Frank W., to Westinghouse Electric Corp. Steam generator sludge lancing method. 4,276,856, Cl. 122-382.000.

Denyer, Clive V.: *See—*
Copp, Frederick C.; Collard, David; and Denyer, Clive V., 4,277,498, Cl. 424-320.000.

DeRemer, Harold A., to General Electric Company. Power interlock switch for electrical appliances. 4,277,659, Cl. 200-61.620.

Dermer, Saul R. Jaw implant measuring instrument. 4,277,237, Cl. 433-72.000.

Dermy, Rene M.: *See—*
Archambaud, Denis G.; and Dermy, Rene M., 4,277,202, Cl. 405-169.000.

Derus, David L. Collapsable, articulated wail structure. 4,276,726, Cl. 52-109.000.

Deschamps, Andre: *See—*
Sugier, Andre; Courty, Philippe; Deschamps, Andre; and Gruhier, Henri, 4,277,458, Cl. 423-437.000.

De Schepper, Achille; and Van Peteghem, Antoine, to Metallurgie Hoboken-Overpelt. Apparatus for liquid-liquid extraction. 4,277,445, Cl. 422-259.000.

Descotes, Maurice J. Photo-processing drum with non-reusable chemicals, for use in daylight conditions, for processing photo-sensitive surfaces with flexible supports. 4,277,159, Cl. 354-312.000.

De Vaan, Robertus L. C.: *See—*
Van Benthem, Willem; and De Vaan, Robertus L. C., 4,277,717, Cl. 313-226.000.

Dick, Gordon A., to Wheelabrator Corporation of Canada Limited. Ultra filtration unit comprising a tubular filter element. 4,277,266, Cl. 55-381.000.

Dickerson, Bobby V.: *See—*
Smith, Dale K.; Donich, Thomas G.; Dickerson, Bobby V.; and Leader, Raymond E., 4,277,845, Cl. 455-52.000.

Dickey-john Corporation: *See—*
Steffen, David E., 4,277,833, Cl. 364-555.000.

Dickhudt, Eugene A.; and Ray, Charles D., to Medtronic, Inc. Lead anchoring device. 4,276,882, Cl. 128-419.00P.

Didycz, William J.: *See—*
Aiken, John E.; and Didycz, William J., 4,277,453, Cl. 423-247.000.

Diemakers, Inc.: *See—*
Spalding, George, 4,276,994, Cl. 220-454.000.

Diethelm, Eugen, to Grissman Chemicals Limited. Process for preparing pyrenzepine. 4,277,399, Cl. 260-239.30T.

Dignum, George: *See—*
Binns, John S.; Braithwaite, Malcolm J.; and Dignum, George, 4,277,629, Cl. 568-779.000.

Dilworth, Louis R., to Allis-Chalmers Corporation. Removal of sulfur dioxide from gas. 4,277,450, Cl. 423-244.000.

Dinkelacker, Walter; and Knoedler, Juergen, to Robert Bosch GmbH. Device for testing ignition system of a combustion engine. 4,277,752, Cl. 324-399.000.

Dinsdale, Jack; Parkins, David W.; and Hardwick, John P., to Cranfield Institute of Technology. Phonograph. 4,277,070, Cl. 369-248.000.

Dittman, William J.: *See—*
Goodman, Robert M., Jr.; and Dittman, William J., 4,277,789, Cl. 343-708.000.

Dittmer, Harold E.: *See—*
Modler, Peter R.; Dittmer, Harold E.; Rose, Richard L.; and Stafsnes, John A., 4,276,752, Cl. 62-166.000.

Doane, William M.: *See—*
Shasha, Baruch S.; Doane, William M.; and Russell, Charles R., 4,277,364, Cl. 252-316.000.

Dr. Johannes Heidenhain GmbH: *See—*
Ernst, Alfons, 4,276,696, Cl. 33-169.00R.

Doerfel, Helmut: *See—*
Naarmann, Herbert; Penzien, Klaus; Doerfel, Helmut; and Eckell, Albrecht, 4,277,588, Cl. 526-114.000.

Doi, Takao; and Nomura, Satoshi, to Kyoto Ceramic Kabushiki Kaisha. Ceramic substrate. 4,277,528, Cl. 428-192.000.

Dominion Auto Accessories Limited: *See—*
Urbanek, Karel; and Bleiweiss, Arthur F., 4,277,818, Cl. 362-61.000.

Dominion Engineering Works Limited: *See—*
Kanger, Feodor, 4,277,221, Cl. 415-160.000.

Domtar Inc.: *See—*
Lucas, John M.; and Nayar, Raman, 4,276,766, Cl. 73-1.00R.

Donich, Thomas G.: *See—*
Smith, Dale K.; Donich, Thomas G.; Dickerson, Bobby V.; and Leader, Raymond E., 4,277,845, Cl. 455-52.000.

Dore, Alain; and Judet, Henri, to Societe D'Applications Generales D'Electricite et de Mecanique Sagem. Machines for measuring the dimensions of workparts. 4,276,698, Cl. 33-174.00L.

Dorfeld, William G., to Corning Glass Works. Coating glass-ceramic surfaces. 4,277,522, Cl. 427-292.000.

Dorina Nahmaschinen GmbH: *See—*
Meier, Willi, 4,276,839, Cl. 112-227.000.

Dorn, Hubert; and Voege, Herbert, to Bayer Aktiengesellschaft. Endoparasiticidal pastes for horses. 4,277,467, Cl. 424-217.000.

Dorsch, Hans-Lothar; and Hermann, Karl H., to Bayer Aktiengesellschaft. Thiazolediazacyanine dyestuffs. 4,277,396, Cl. 260-146.00R.

Dotson, Samuel C.: *See—*
Mamula, Ronald S.; and Dotson, Samuel C., 4,276,956, Cl. 182-128.000.

Dover Corporation: *See—*
Ostand, Paul R., 4,276,916, Cl. 141-206.000.

Dow Chemical Company, The: *See—*
Daniel, John K.; and Peet, Norton P., 4,277,492, Cl. 424-304.000.
Kalmbach, Debra S. K., 4,277,637, Cl. 585-828.000.

Dowell, Terrence P.; Banks, Edwin L., Jr.; and Luce, Carl T., to Barry Wright Corporation. Snubber assembly. 4,276,967, Cl. 188-134.000.

Drabek, Jozef: *See—*
Farooq, Saleem; Ackermann, Peter; Drabek, Jozef; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,277,494, Cl. 424-305.000.

Draco Laboratories, Inc.: *See—*
Schotz, Larry A.; and Wiesmann, Thomas W., 4,277,785, Cl. 340-753.000.

Dragerwerk Aktiengesellschaft: *See—*
Gdulla, Manfred, 4,276,877, Cl. 128-200.270.
Leichnitz, Kurt, 4,277,251, Cl. 23-232.00R.
Van der Smissen, Carl-Ernst; and Pantaleon-Stemberg, Gerd, 4,277,443, Cl. 422-122.000.

Drake, Leo O.; and Drake, Randall S. Printed circuit board storage cabinet. 4,277,120, Cl. 312-320.000.

Drake, Randall S.: *See—*
Drake, Leo O.; and Drake, Randall S., 4,277,120, Cl. 312-320.000.

Drake, Samuel H.; and Simunovic, Sergio N., to Astek Engineering, Inc. Compliance element for remote center compliance unit. 4,276,697, Cl. 33-169.00C.

Drautz, Hannelore: *See—*
Zahner, Hans; Drautz, Hannelore; and Keller, Walter, 4,277,478, Cl. 424-258.000.

Dresser Industries, Inc.: *See—*
Crow, Morgan L., 4,277,109, Cl. 308-8.200.
Fox, Lenwood, 4,277,110, Cl. 308-8.200.

Drzewiecki, Tadeusz M., to United States of America, Army. Apparatus and method for temperature compensation of fluidic circuits. 4,276,895, Cl. 137-2.000.

Dubois, Claude; and Surdi, Jean M., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Rotor for jet engines. 4,277,225, Cl. 416-198.00A.

Dubois, Jean-Claude: *See—*
Eranian, Armand; Dubois, Jean-Claude; Couttet, Andre; and Datamanti, Evelyne, 4,277,554, Cl. 430-270.000.

Dudt, Philip J., to Conoco, Inc. Method for producing agglomerates from finely divided carbonaceous solids. 4,277,252, Cl. 23-313.00R.

Duhayon, Jacques; Goumondy, Jean-Pierre; Leudet, Alain; and Rousseau, Jean-Claude, to Commissariat a l'Energie Atomique. Method for processing a mixture of air and rare gases, especially xenon and krypton. 4,277,363, Cl. 252-301.10W.

Duhl, Daniel, to Polylok Corporation. Wall construction material comprising a rigid support with a textile material facing laminated thereto. 4,277,527, Cl. 428-109.000.

Dukane Corporation: *See—*
Harwood, Philip C.; and Johnson, George H., 4,277,710, Cl. 310-316.000.

Dunkley, Michael: *See—*
Burnett, Stanley F.; Dunkley, Michael; Grimes, Raymond M.; and Parmee, Keith, 4,276,972, Cl. 192-4.00C.

Dunn, Robert M.; Schulman, Martin D.; and Timko, Nicholas, Jr., to International Business Machines Corporation. Electronic circuit module cooling. 4,277,816, Cl. 361-384.000.

Dunning, Gordon R., to International Business Machines Corporation. Sheet feeder for typewriters. 4,277,059, Cl. 271-23.000.

Dunovsky, Sergei A.: *See—*
Barsukov, Vyacheslav Z.; Dunovsky, Sergei A.; Sagoian, Lenik N.; Trepalin, Anatoly I.; Aguf, Igor A.; and Smolkova, Valentina S., 4,277,546, Cl. 429-59.000.

Dunstan, Phillip E.; and McConnell, Charles H., to Boeing Company, The. Accelerating and decelerating moving walkway with minimal walkway surface irregularities. 4,276,976, Cl. 198-334.000.

Du Pont de Nemours, E. I., and Company: *See—*
Conageski, Raymond H., 4,277,331, Cl. 23-293.00R.

DuPont, Regis; Lardenois, Patrick; Morel, Claude; Frost, Jonathan; and Koletar, Gabor I., to Synthelabo. Derivatives of fluorenes and fluoranthenes and process for their preparation. 4,277,476, Cl. 424-250.000.

Duquenne, Michel G. A.; David, Guy A. J.; Grima, Jean-Claude; and Daguet, Jacques L., to U.S. Philips Corporation. Closed-loop telecommunication system. 4,277,843, Cl. 370-84.000.

Durant, Graham J.; Emmett, John C.; Ganellin, Charon F.; and Prain, Hunter D., to Smith Kline & French Laboratories Limited. Oxazole or isoxazole alkylamino ethylene compounds as inhibitors of H-2 histamine receptors. 4,277,485, Cl. 424-272.000.

Durkoppwerke GmbH: *See—*
Biermann, Kurt; and Reinke, Kurt, 4,276,837, Cl. 112-152.000.

Dusenbery, John F.: *See—*
Landskroener, Peter A.; Dusenbery, John F.; and Young, Roger W., 4,277,010, Cl. 226-95.000.

Dusheck, George J., Jr., to United States of America, Navy. Output one-shot. 4,277,700, Cl. 307-273.000.

Dutton, Robert E.: *See—*
Calhoun, Michael B.; Bayh, Russell I., III; and Dutton, Robert E., 4,276,937, Cl. 166-323.000.

Dyett, Derek H.; and Rakowicz, Jan A., to Molins Limited. Trimming devices for cigarette-making machines. 4,276,891, Cl. 131-84.00C.

Dymond, Richard W., to TRW Inc. Power steering valve and method of making the same. 4,276,812, Cl. 91-467.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, 4,277,418, Cl. 260-465.400.
Beckmann, Rolf; and Knackstedt, Wilhelm, 4,277,538, Cl. 428-429.000.

Dyneer Corporation: *See—*
Kraft, Derald H., 4,277,240, Cl. 474-110.000.
E-B Industries, Inc.: *See—*
Kelly, Cornelius J. N., 4,277,673, Cl. 219-528.000.
E M I Limited: *See—*
Birt, David E.; and Holt, Lyn, 4,277,071, Cl. 369-84.000.
Eastman Kodak Company: *See—*
Jessop, Thomas C.; and Smith, William L., 4,277,440, Cl. 422-100.000.
Eastman Technology, Inc.: *See—*
Jeffers, Frederick J.; and McClure, Richard J., 4,277,806, Cl. 360-16.000.
Eaton Corporation: *See—*
Sugiyama, Jun-ichi, 4,276,961, Cl. 187-9.00E.
Ebauches S.A.: *See—*
Saurer, Eric; Gharadjedaghi, Fereydoun; Laesser, Claude; Viennet, Rene; and Ruedin, Yves, 4,277,144, Cl. 350-349.000.
Eckbreth, Alan C., to United Technologies Corporation. Crossed-beam phase-matched coherent anti-stokes raman spectroscopy. 4,277,760, Cl. 331-94.50N.
Eckell, Albrecht: *See—*
Naarmann, Herbert; Penzien, Klaus; Doerfel, Helmut; and Eckell, Albrecht, 4,277,588, Cl. 526-114.000.
Eckert, Dieter: *See—*
Klein, Wilhelm; Bausch, Max; and Eckert, Dieter, 4,277,099, Cl. 296-146.000.
Economy Engine Company, The: *See—*
Beeghly, Bruce R., 4,277,724, Cl. 315-57.000.
Eda, Tadahiro: *See—*
Tatsumi, Susumu; Eda, Tadahiro; and Imai, Chikara, 4,277,549, Cl. 430-30.000.
Edo Corporation: *See—*
Miko, Richard J.; and Shapiro, Daniel H., 4,277,261, Cl. 55-278.000.
Miko, Richard J.; and Shapiro, Daniel H., 4,277,262, Cl. 55-278.000.
Educational Health Products, Inc.: *See—*
Thornton, Thomas F., 4,277,297, Cl. 156-161.000.
Egami, Tsuneyuki: *See—*
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,276,773, Cl. 73-204.000.
Eguchi, Katsumi. Single-seat globe control valve. 4,276,906, Cl. 137-625.380.
Eichenauer, Rudolf. Steering column and ignition lock for motor vehicle. 4,276,761, Cl. 70-252.000.
Eichenberger, Werner, to Gebruder Loepfe AG. Photoelectrical bobbin feeler. 4,276,910, Cl. 139-273.00A.
Eichhorn, Wilfried, to Hoechst Aktiengesellschaft. N-vinylamide polymers and process for their manufacture using two types of initiators. 4,277,592, Cl. 526-227.000.
Eicken, Karl; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicidal agents based on acetanilides. 4,277,278, Cl. 71-92.000.
Eiden, Leo: *See—*
Rasmussen, Glenn; Huston, Larry; Morse, Donald W.; Tsuchiya, Takuzo; Morrison, Clifton H.; Rustad, Stanley C.; and Eiden, Leo, 4,276,795, Cl. 83-42.000.
Ejzak, Edward M., to Astro Resources Corporation. Method and apparatus for measuring the amount of carbon and other organics in an aqueous solution. 4,277,438, Cl. 422-80.000.
El Paso Products Company: *See—*
Mehra, Yuv R.; and Clark, Ralph E., 4,277,313, Cl. 203-32.000.
Electric Power Research Institute: *See—*
Rios, Pedro A., 4,277,705, Cl. 310-64.000.
Electric Power Research Institute, Inc.: *See—*
Deno, Don W., 4,277,745, Cl. 324-72.000.
Eli Lilly and Company: *See—*
Lacefield, William B.; and Simon, Richard L., 4,277,471, Cl. 424-248.400.
Lacefield, William B.; and Simon, Richard L., 4,277,495, Cl. 424-309.000.
Molloy, Bryan B.; and Steinberg, Mitchell I., 4,277,501, Cl. 424-330.000.
Zimmerman, Dennis M.; and Robey, Roger L., 4,277,608, Cl. 546-339.000.
Ellerman, Kathryn M.: *See—*
Inks, Clyde G.; Compton, John W.; Ellerman, Kathryn M.; and Bergman, Lee H., 4,277,520, Cl. 427-220.000.
Ellis, John D.: *See—*
Ore, Fernando; Ellis, John D.; and Moore, James H., 4,277,448, Cl. 423-167.000.
Eltra Corporation: *See—*
Sakabinos, Steven, 4,277,154, Cl. 354-5.000.
Emelyanov, Igor V.: *See—*
Klimenko, Alexandr S.; Emelyanov, Igor V.; Krylov, Anatoly A.; and Yantovsky, Semen A., 4,276,938, Cl. 169-47.000.
Emery Industries, Inc.: *See—*
Li, Thomas Z.; and Lamont, James, 4,277,410, Cl. 260-404.000.
Emmett, John C.: *See—*
Durant, Graham J.; Emmett, John C.; Ganellin, Charon F.; and Prain, Hunter D., 4,277,485, Cl. 424-272.000.
Endowment and Research Foundation at Montana State University: *See—*
Strobel, Gary A., 4,277,462, Cl. 424-93.000.
Energy Systems, Incorporated: *See—*
Hanson, Robert C., 4,277,254, Cl. 48-180.00R.
Enoguchi, Yuji: *See—*
Wada, Kenichi; Murasaki, Hiroshi; Enoguchi, Yuji; and Fujiwara, Takao, 4,277,165, Cl. 355-55.000.
Enomoto, Satoru; Wada, Hisayuki; Nishita, Sadao; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Palladium complex, process for the preparation thereof and catalyst for producing 1,3-diene oligomers. 4,277,633, Cl. 568-879.000.
Enomoto, Seikichiro; and Hatakeyama, Yoshiharu. Compact. 4,276,893, Cl. 132-83.00R.
Enyart, David O.: *See—*
Kastura, John L.; and Enyart, David O., 4,277,772, Cl. 340-52.[illegible] F.
Eotec Corporation: *See—*
Krohn, David A., 4,277,270, Cl. 65-3.00A.
Krohn, David A., 4,277,271, Cl. 65-3.00A.
Eppel, Joseph C., to United States of America, Navy. Depth mapping system. 4,277,167, Cl. 356-5.000.
Eranian, Armand; Dubois, Jean-Claude; Couttet, Andre; and Datamanti, Evelyne, to Thomson-CSF. Resin with a thietane ring, cross-linkable by electron photon irradiation, and process for using such a resin. 4,277,554, Cl. 430-270.000.
Erdmann, Francis M.: *See—*
Beguwala, Moiz M. E.; and Erdmann, Francis M., 4,277,320, Cl. 204-164.000.
Erickson Tool Company: *See—*
Benjamin, Milton L.; and Miles, Wilbur N., 4,277,209, Cl. 408-139.000.
Ermilin, Igor V.: *See—*
Bryansky, Jury A.; Gess de Kalve, Stanislav B.; and Ermilin, Igor V., 4,277,085, Cl. 280-660.000.
Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Precision length measuring instrument. 4,276,696, Cl. 33-169.00R.
Espig, Winfried: *See—*
Rentschler, Waldemar; Starp, Franz; and Espig, Winfried, 4,277,155, Cl. 354-23.00D.
Essex Cryogenics of Missouri Inc.: *See—*
Lyons, Jerry L., 4,276,901, Cl. 137-469.000.
Eta A.G. Ebauches-Fabrik: *See—*
Giger, Urs; and Perucchi, Norberto, 4,277,704, Cl. 310-49.00R.
Etablissements Carpano and Pons: *See—*
Saligny, Yves, 4,277,643, Cl. 179-1.0PC.
Ethyl Corporation: *See—*
Bittner, John M., 4,276,770, Cl. 73-35.000.
Evangelow, James. Stove pipe heater. 4,276,926, Cl. 165-39.000.
Evolution SA: *See—*
Kempf, Gerhard; and Kunz, Albert, 4,276,739, Cl. 57-91.000.
Exxon Research & Engineering Co.: *See—*
Bock, Jan; Makowski, Henry S.; and Lundberg, Robert D., 4,277,381, Cl. 260-23.50A.
Brois, Stanley J.; Ryer, Jack; and Winans, Esther D., 4,277,354, Cl. 252-51.50R.
Deen, Harold E.; O'Halloran, Rosemary; Winans, Esther D.; Ryer, Jack; and Brois, Stanley J., 4,277,353, Cl. 252-51.50R.
Greenwood, Sydney H., 4,277,324, Cl. 208-45.000.
Greenwood, Sydney H. J., 4,277,325, Cl. 208-45.000.
Grimes, Patrick G.; and Zahn, Markus, 4,277,317, Cl. 204-1.00R.
Langer, Arthur W., Jr., 4,277,590, Cl. 526-127.000.
Rello, Michael J., 4,277,187, Cl. 400-248.000.
Sawyer, Willard H.; and Cull, Neville L., 4,277,373, Cl. 252-437.000.
Schlosberg, Richard H.; and Scouten, Charles G., 4,277,326, Cl. 208-263.000.
Schlosberg, Richard H.; and Gorbaty, Martin L., 4,277,327, Cl. 208-263.000.
Varma, Vijaya K., 4,277,417, Cl. 260-456.00R.
F. L. Smidth & Co.: *See—*
Bojsen, Erik M., 4,277,258, Cl. 55-152.000.
Faldella, Roberto; and Margary, Riccardo, to Fiat Societa Per Azioni. Heat recovery system. 4,276,747, Cl. 60-618.000.
Falkenstein, Georg; and Kessler, Hansjuergen, to BASF Aktiengesellschaft. Urethane group-containing polyisocyanurate foam based on naphthenic acid-hydroxylamine adduct. 4,277,571, Cl. 521-164.000.
Farcnik, Alexander. Insulative fireproof textured coating. 4,277,355, Cl. 252-62.000.
Farmitalia Carlo Erba, S.p.A.: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,277,491, Cl. 424-285.000.
Farooq, Saleem; Ackermann, Peter; Drabek, Jozef; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, to Ciba-Geigy Corporation. Novel esters. 4,277,494, Cl. 424-305.000.
Faulbecker, Gerd, to Gelenkwellenbau GmbH. Centered double joint. 4,276,759, Cl. 64-17.00R.
Faulkner, Eric A., to Brookdeal Electronics Limited. Rectifier circuits. 4,277,753, Cl. 328-26.000.
Fausone, Alfredo; and Seano, Vittorio, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Circuit arrangement for driving nonlinear threshold devices. 4,277,755, Cl. 330-128.000.
Faustini, Franco: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,277,491, Cl. 424-285.000.
Faxvog, Frederick R.; and Krage, Mark K., to General Motors Corporation. Microwave acoustic spectrometer. 4,277,741, Cl. 324-58.50C.
Federal-Mogul Corp.: *See—*
Ladin, Eli M., 4,276,974, Cl. 192-98.000.
Feldman, Martin L.; and De Groff, James T., to Tenneco Chemicals, Inc. Thickening agents for unsaturated polyester resin compositions. 4,277,392, Cl. 260-40.00R.

Fenk, Josef: *See—*
Kriedt, Hans; and Fenk, Josef, 4,277,756, Cl. 330-261.000.
Ferdinand Menrad: *See—*
Schonhut, Kurt, 4,277,151, Cl. 351-41.000.
Ferguson, Andrew C., to W. & T. Avery Limited. Force transducer. 4,276,772, Cl. 73-862.620.
Ferguson, Lyndel G., to Halliburton Company. Insert type soft chuck jaws. 4,277,073, Cl. 279-1.0SJ.
Ferla, Giuseppe: *See—*
Cerofolini, Gianfranco; and Ferla, Giuseppe, 4,277,291, Cl. 148-1.500.
Ferraro, Dominick, to Chisholm-Ryder Co., Inc. Hop picking machine. 4,276,738, Cl. 56-130.000.
Ferriss, Lincoln S.: *See—*
Ljung, Bo H. G.; and Ferriss, Lincoln S., 4,277,173, Cl. 356-350.000.
Feuerbaum, Hans P., to Siemens Aktiengesellschaft. Apparatus and method for contact-free potential measurements of an electronic composition. 4,277,679, Cl. 250-310.000.
Fiat Societa Per Azioni: *See—*
Faldella, Roberto; and Margary, Riccardo, 4,276,747, Cl. 60-618.000.
Fichera, Anthony T. Tobacco smoking inhibitor. 4,276,890, Cl. 131-270.000.
FilmTec Corporation: *See—*
Cadotte, John E., 4,277,344, Cl. 210-654.000.
Finike Italiana Marposs S.p.A.: *See—*
Possati, Mario; and Longhi, Giuliano, 4,277,121, Cl. 312-320.000.
Fire (Waterless Sprinklers) Limited: *See—*
Atack, Joseph, 4,276,939, Cl. 169-60.000.
Firmenich SA: *See—*
Schulte-Elte, Karl-Heinrich; Hauser, Arnold; and Ohloff, Gunther, 4,277,625, Cl. 568-341.000.
Fischer, Siegbert: *See—*
Pfalzer, Lothar; and Fischer, Siegbert, 4,277,328, Cl. 209-169.000.
Fisher, Dennis H.: *See—*
Norton, Richard V.; Frank, Peter J.; Fisher, Dennis H.; and Howe, Steven C., 4,277,636, Cl. 585-14.000.
Fisher, Robert D.; and Katz, Eric R., to Memorex Corporation. Apparatus for recording magnetic impulses perpendicular to the surface of a recording medium. 4,277,809, Cl. 360-131.000.
Fisher, Stephen G.: *See—*
Zabik, Alexander J.; and Fisher, Stephen G., 4,277,153, Cl. 353-27.00R.
Fisher, Theodore H., II; and Cusimano, Richard J., to Basic Incorporated. Telephone dialer. 4,277,651, Cl. 179-90.00B.
Fitzgerald, Harry J.: *See—*
Koppers, Manfred; Bohnes, Karlheinz; and Fitzgerald, Harry J., 4,277,204, Cl. 405-288.000.
Fleek, Arthur E.: *See—*
Davis, Glenn W.; and Fleek, Arthur E., 4,277,191, Cl. 400-582.000.
Flowers, Ralph G., to General Electric Company. Electrical insulating composition comprising an epoxy resin, a phenolic resin and a polyvinyl acetal resin in combination. 4,277,534, Cl. 428-379.000.
FMC Corporation: *See—*
Fujita, George, 4,276,917, Cl. 141-387.000.
Thompson, John S.; and Jadlocki, Joseph F., Jr., 4,277,507, Cl. 426-264.000.
Foley, James W., to Polaroid Corporation. Novel triarylmethane compounds. 4,277,406, Cl. 260-389.000.
Foley, James W., to Polaroid Corporation. Novel triarylmethane compounds. 4,277,407, Cl. 260-390.000.
Forch, Hans, to Carl Freudenberg, Firma. Seal for the gap between a revolving shaft and the bore of a housing against a mixture of a liquid and a gas. 4,277,072, Cl. 277-65.000.
Ford Aerospace & Communications Corp.: *See—*
Cushing, Charles J.; Phillips, Clifton W.; and VanderNeut, Richard D., 4,277,178, Cl. 356-431.000.
Ford Motor Company: *See—*
Anderson, Dale W., 4,276,783, Cl. 74-15.630.
Giachino, Joseph M.; Haeberle, Russell J.; and Crow, Joseph W., 4,277,814, Cl. 361-283.000.
Formax, Inc.: *See—*
Sandberg, Glenn A.; and Janssen, Wilbur A., 4,276,753, Cl. 62-186.000.
Forsch, Manfred; Schaub, Wolfgang; and Gerhards, Hermann, to Hoechst Aktiengesellschaft. Heterocyclic spiro-linked amidines, compositions and use thereof. 4,277,470, Cl. 424-246.000.
Forss, Kaj G.; Talka, Esko T.; and Fremer, Kaj-Erik. Method for the isolation of vanillin from lignin in alkaline solutions. 4,277,626, Cl. 568-438.000.
Fortmann, Hermann, to Olympia Werke AG. Photocopier photoconductive sheet holding device. 4,277,164, Cl. 355-16.000.
Fournel, Francis; and Soussan, Salomon, to Rhone-Progil. Vertical autoclave for bulk polymerization of vinyl chloride. 4,277,585, Cl. 526-65.000.
Fournet, Julien: *See—*
Bonnet, Jean; and Fournet, Julien, 4,277,750, Cl. 324-201.000.
Fournier, Roger H., to Warner & Swasey Company, The. Compensating steadyrest. 4,276,723, Cl. 51-238.00S.
Foust, Harry D., to Trane Company, The. Plate type heat exchanger. 4,276,927, Cl. 165-70.000.
Fox, Lenwood, to Dresser Industries, Inc. Earth boring bit with eccentric seal groove. 4,277,110, Cl. 308-8.200.
Fozo, Andras: *See—*
Makara, Gyorgy; Morlin, Andras; Fozo, Andras; and Fulop, Robert, 4,276,818, Cl. 98-40.00B.
Frank, Peter J.: *See—*
Norton, Richard V.; Frank, Peter J.; Fisher, Dennis H.; and Howe, Steven C., 4,277,636, Cl. 585-14.000.
Fraser, Ward M. Method and device for blocking wells to extinguish fires, prohibit saltwater intrusion, etc. 4,276,934, Cl. 166-286.000.
Frei, Bernhard: *See—*
Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, 4,277,036, Cl. 242-107.40A.
Fremer, Kaj-Erik: *See—*
Forss, Kaj G.; Talka, Esko T.; and Fremer, Kaj-Erik, 4,277,626, Cl. 568-438.000.
Fremont, Michael J., to Kransco Manufacturing, Inc. Soft sailboard. 4,276,844, Cl. 114-39.000.
Frey, William I.: *See—*
Cherenko, Joseph; Frey, William I.; Kelly, Joseph D.; and Sokol, Larry S., 4,277,299, Cl. 156-242.000.
Friedman, Norman J., to Johnson & Johnson. Bonding of lightweight tissue paper. 4,277,529, Cl. 428-211.000.
Frito-Lay, Inc.: *See—*
Wicklund, Peter A.; and Ivers, John T., 4,277,510, Cl. 426-441.000.
Fritz, William L., to Baldwin Piano & Organ Company. Stop tab for capture combination action systems used in electronic organs. 4,276,803, Cl. 84-343.000.
Fritzon, Hans G.: *See—*
Pejchal, Karel; Fritzon, Hans G.; and Lindstrom, Raimo, 4,276,912, Cl. 139-437.000.
Fromantin, Jean-Pierre M. J., to Unicler. Analgesic 2-(M-benzoylphenoxy)-propionic acid derivatives. 4,277,497, Cl. 424-316.000.
Fromson, Howard A.; and Gracia, Robert F., to Fromson, Howard A. Aluminum lithographic plate with visible image and process. 4,277,555, Cl. 430-278.000.
Froning, H. Robert: *See—*
Powers, George W., Jr.; Froning, H. Robert; and Taggart, Davis L., 4,277,351, Cl. 252-8.55D.
Frost, Jonathan: *See—*
DuPont, Regis; Lardenois, Patrick; Morel, Claude; Frost, Jonathan; and Koletar, Gabor I., 4,277,476, Cl. 424-250.000.
Frye, Robert B., to General Electric Company. Silicone resin coating composition. 4,277,287, Cl. 106-287.120.
Fuchs, Otto, to Hoechst Aktiengesellschaft. Monoazo compounds deriving from 5-amino-benzimidazole-2-one-6-carboxylic acid. 4,277,397, Cl. 260-157.000.
Fuel Computer Corporation of America: *See—*
Palmieri, Joseph M., 4,276,925, Cl. 165-12.000.
Fuji Electric Co., Ltd.: *See—*
Sano, Yasukazu, 4,277,803, Cl. 358-106.000.
Fujii, Kiyoshi; Tsuji, Keiji; and Nishimoto, Seiya, to Laurel Bank Machine Co., Ltd. Bill discriminating apparatus. 4,277,774, Cl. 340-146.30Q.
Fujino, Hisaaki: *See—*
Kanamaru, Naokatu; Imai, Kazuo; and Fujino, Hisaaki, 4,277,340, Cl. 210-433.200.
Fujino, Masahiko; Shinagawa, Susumu; and Kawai, Kiyohisa, to Takeda Chemical Industries, Ltd. Tetrapeptidehydrazide derivatives. 4,277,394, Cl. 260-112.50R.
Fujita, George, to FMC Corporation. Mobile apparatus for fluid transfer. 4,276,917, Cl. 141-387.000.
Fujita, Hisao; Tanaka, Yasuhiko; Kobayashi, Isao; and Nakamura, Ken, to Konishiroku Photo Industry Co., Ltd. Apparatus for detecting toner density. 4,276,854, Cl. 118-689.000.
Fujiwara, Kunihiko; Osawa, Kazuya; Takeda, Yoshiteru; and Yabumoto, Toshiaki, to Furukawa Electric Company, Ltd., The; and Furukawa Battery Co., The. Galvanic cell separator. 4,277,572, Cl. 525-61.000.
Fujiwara, Takao: *See—*
Wada, Kenichi; Murasaki, Hiroshi; Enoguchi, Yuji; and Fujiwara, Takao, 4,277,165, Cl. 355-55.000.
Fukui, Seiji, to Shimano Industrial Company, Limited. Control mechanism for a transmitting-pawl at a transmission hub for a bicycle. 4,276,973, Cl. 192-47.000.
Fukushima, Yoshio; and Kanmoto, Yoshiaki, to Ricoh Company, Ltd. Focusing position detection apparatus. 4,277,156, Cl. 354-25.000.
Fulmer, Norman C.; and Kewley, Norman E., to General Electric Company. Percussive flashcube arrangement. 4,277,234, Cl. 431-361.000.
Fulop, Robert: *See—*
Makara, Gyorgy; Morlin, Andras; Fozo, Andras; and Fulop, Robert, 4,276,818, Cl. 98-40.00B.
Fumagalli, Angelo: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,277,491, Cl. 424-285.000.
Funke, Mandred: *See—*
Johne, Hans; Jentzsch, Arndt; Schmidt, Lothar; Muller, Wolfgang; and Funke, Mandred, 4,276,827, Cl. 101-212.000.
Furer, Lotti: *See—*
Keller, Karlheinz; and Furer, Lotti, 4,277,247, Cl. 8-557.000.
Furukawa Battery Co., The: *See—*
Fujiwara, Kunihiko; Osawa, Kazuya; Takeda, Yoshiteru; and Yabumoto, Toshiaki, 4,277,572, Cl. 525-61.000.
Furukawa Electric Company, Ltd., The: *See—*
Fujiwara, Kunihiko; Osawa, Kazuya; Takeda, Yoshiteru; and Yabumoto, Toshiaki, 4,277,572, Cl. 525-61.000.

Furuta, Kenzi: *See*—
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,277,674, Cl. 235-92.0EA.

Fushiki, Isamu: *See*—
Koboshi, Sigeharu; Fushiki, Isamu; and Sakamoto, Kenro, 4,277,556, Cl. 430-393.000.

Futober Epuletgepeszeti Termekeket Gyarto Vallalat: *See*—
Makara, Gyorgy; Morlin, Andras; Fozo, Andras; and Fulop, Robert, 4,276,818, Cl. 98-40.00B.

G. L. Rexroth GmbH: *See*—
Dantlgraber, Jorg, 4,277,228, Cl. 417-273.000.

GAF Corporation: *See*—
Charles, John J., 4,277,391, Cl. 260-40.00R.

Gaibov, Gjuloglan G. O.: *See*—
Kuliev, Aladdin M. O.; Kadyrov, Tokhrul A. O.; Gaibov, Gjuloglan G. O.; Sinaisky, Anatoly G.; and Matiyasevich, Valentina N., 4,277,390, Cl. 260-37.0EP.

Gamble, William L.: *See*—
Morgan, Robert L.; Cupitt, Larry T.; and Gamble, William L., 4,277,146, Cl. 350-356.000.

Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., to Farmitalia Carlo Erba, S.p.A. Bicyclic prostaglandins. 4,277,491, Cl. 424-285.000.

Ganellin, Charon F.: *See*—
Durant, Graham J.; Emmett, John C.; Ganellin, Charon F.; and Prain, Hunter D., 4,277,485, Cl. 424-272.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Haberstroh, Markus; and Bernardi, Herbert, 4,276,736, Cl. 53-399.000.

Gardner, Billy R. Periscopic mirror. 4,277,142, Cl. 350-302.000.

Garibotto, Giovanni, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Wave-signal-processing system with a two-dimensional recursive digital filter. 4,277,834, Cl. 364-724.000.

Garner, Robert; and Whitehead, Michael J., to Ciba-Geigy Corporation. 2(Indol-3'-oyl) 3,4,5,6-tetrahalo benzoic acid anhydrides. 4,277,400, Cl. 260-326.13B.

Garrett Corporation, The: *See*—
LaGrone, Charles H., 4,276,743, Cl. 60-39.14R.
Silver, Alexander; and Wuertz, Kenneth L., 4,277,707, Cl. 310-104.000.

Garvey, Peter M. Liquid chemical spraying apparatus movable by a tower-type water irrigation system. 4,277,026, Cl. 239-127.000.

Garziera, Gastone; and Pisani, Federico, to Ing. C. Olivetti & C., S.p.A. Apparatus for recording and displaying or plotting graphs. 4,277,835, Cl. 364-900.000.

Gaski, John M. Flexible member caddy. 4,277,035, Cl. 242-85.900.

Gdulla, Manfred, to Dragerwerk Aktiengesellschaft. Respiratory method and apparatus. 4,276,877, Cl. 128-200.270.

Gebruder Boehringer G.m.b.H.: *See*—
Berbalk, Hermann, 4,276,794, Cl. 82-1.00C.

Gebruder Loepfe AG: *See*—
Eichenberger, Werner, 4,276,910, Cl. 139-273.00A.

Geczy, Bela, to Smith International, Inc. In-hole motor with bit clutch. 4,276,944, Cl. 175-102.000.

Gelbein, Abraham P.; and Khonsari, Ali M., to Lummus Company, The. Catalyst and process for producing aromatic hydroxy compounds. 4,277,630, Cl. 568-801.000.

Gelenkwellenbau GmbH: *See*—
Faulbecker, Gerd, 4,276,759, Cl. 64-17.00R.

Gelman Sciences, Inc.: *See*—
Baughn, John W., 4,277,332, Cl. 210-96.200.

Gendy, Moheb M.: *See*—
Andrews, James P.; Callahan, Arthur C.; and Gendy, Moheb M., 4,277,290, Cl. 134-10.000.

General Atomic Company: *See*—
Ohkawa, Tihiro, 4,277,306, Cl. 176-9.000.

General Dynamics Corporation: *See*—
Burgeson, John E.; and Lieurance, Dennis W., 4,277,768, Cl. 335-216.000.

General Electric Company: *See*—
Carnahan, James C., 4,277,628, Cl. 568-749.000.
DeRemer, Harold A., 4,277,659, Cl. 200-61.620.
Flowers, Ralph G., 4,277,534, Cl. 428-379.000.
Frye, Robert B., 4,277,287, Cl. 106-287.120.
Fulmer, Norman C.; and Kewley, Norman E., 4,277,234, Cl. 431-361.000.
Gustafson, Ralph W., 4,276,690, Cl. 29-602.00R.
Haaf, William R.; and Shank, Charles P., 4,277,575, Cl. 525-89.000.
Hall, Walter L.; Jaquiss, Donald B. G.; and Mark, Victor, 4,277,598, Cl. 528-199.000.
Jones, Dwight V., 4,277,672, Cl. 219-497.000.
Kast, Howard B., 4,276,809, Cl. 91-417.00R.
King, Robert D., 4,277,787, Cl. 343-100.0SA.
Mark, Victor, 4,277,597, Cl. 528-199.000.
Mark, Victor, 4,277,599, Cl. 528-199.000.
Mark, Victor; and Hedges, Charles V., 4,277,600, Cl. 528-204.000.
Pisano, Alan D., 4,276,744, Cl. 60-39.16R.
Urick, Palmer D.; and Bienz, Robert H., 4,276,689, Cl. 29-596.000.
Waldron, Wesley K., 4,277,786, Cl. 340-765.000.
Wong, Thomas Y., 4,277,832, Cl. 364-510.000.

General Foods Corporation: *See*—
Reussner, George H.; and Thiessen, Reinhardt, Jr, 4,277,464, Cl. 424-177.000.

General Industries, Inc.: *See*—
Grenier, Wilfred J., 4,277,020, Cl. 237-1.00R.

General Mills, Inc.: *See*—
Rasmussen, Glenn; Huston, Larry; Morse, Donald W.; Tsuchiya, Takuzo; Morrison, Clifton H.; Rustad, Stanley C.; and Eiden, Leo, 4,276,795, Cl. 83-42.000.

General Motors Corporation: *See*—
Arnoldussen, Thomas C., 4,277,147, Cl. 350-357.000.
Delp, Hermann; and Muller, Norbert, 4,277,658, Cl. 200-61.540.
Faxvog, Frederick R.; and Krage, Mark K., 4,277,741, Cl. 324-58.50C.
Horvath, Richard A., 4,276,971, Cl. 188-322.000.
Kastura, John L.; and Enyart, David O., 4,277,772, Cl. 340-52.00F.
Kearney, Mark B.; Mowery, Kenneth D.; and Pechous, L. Joseph, 4,276,861, Cl. 123-425.000.
Kennedy, Richard A., 4,277,757, Cl. 330-300.000.
Livesay, J. D., 4,276,756, Cl. 62-503.000.
Loose, Richard D.; and Kapanka, Harley L., 4,277,037, Cl. 242-107.40A.
Mercer, Robert R., 4,277,012, Cl. 227-68.000.
Viers, Homer J., 4,277,092, Cl. 285-263.000.
Voss, Richard J., 4,277,738, Cl. 322-28.000.

General Time Corporation: *See*—
Ogden, Gerald W., 4,277,841, Cl. 368-78.000.

Genis, Mariano R. Slate for writing braille. 4,277,239, Cl. 434-115.000.

Gensurowsky, Walter. Toilet facility. 4,276,663, Cl. 4-313.000.

George, Richard F., to Keene Corporation. Internally reinforced ball bearing spacer. 4,277,117, Cl. 308-199.000.

Georgia Tech Research Institute: *See*—
Goodman, Robert M., Jr.; and Dittman, William J., 4,277,789, Cl. 343-708.000.

Gerbi, Giuseppe: *See*—
Audone, Bruno; Bolla, Luciano; and Gerbi, Giuseppe, 4,277,744, Cl. 324-72.000.

Gerhard Peter KG: *See*—
Peter, Gerhard, 4,276,815, Cl. 493-287.000.

Gerhards, Hermann: *See*—
Forsch, Manfred; Schaub, Wolfgang; and Gerhards, Hermann, 4,277,470, Cl. 424-246.000.

Gerst, Carl W.; and Paciorek, Leonard J., to Anaren Microwave, Incorporated. Angle digitizer. 4,277,748, Cl. 324-83.00D.

Gess de Kalve, Stanislav B.: *See*—
Bryansky, Jury A.; Gess de Kalve, Stanislav B.; and Ermilin, Igor V., 4,277,085, Cl. 280-660.000.

Gettleman, Sara L. Game device with board surfaces visible only to opposing players. 4,277,067, Cl. 273-271.000.

Getty Oil Company, Inc.: *See*—
McKinzie, Howard L., 4,276,936, Cl. 166-303.000.

Getty Synthetic Fuels, Inc.: *See*—
Ham, Robert K., 4,276,778, Cl. 73-864.430.

Gharadjedaghi, Fereydoun: *See*—
Saurer, Eric; Gharadjedaghi, Fereydoun; Laesser, Claude; Viennet, Rene; and Ruedin, Yves, 4,277,144, Cl. 350-349.000.

Giachino, Joseph M.; Haeberle, Russell J.; and Crow, Joseph W., to Ford Motor Company. Semiconductor variable capacitance pressure transducer assembly. 4,277,814, Cl. 361-283.000.

Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, to Montedison S.p.A.; and Mitsui Petrochemical Industries, Ltd. Components of catalysts useful for the polymerization of alpha-olefins, and catalysts prepared therefrom. 4,277,589, Cl. 526-122.000.

Gibney, Lloyd. Foldable truck cap assembly. 4,277,098, Cl. 296-100.000.

Gielen, Hendrik A. L.: *See*—
Lemmens, Alfons E.; and Gielen, Hendrik A. L., 4,276,921, Cl. 164-4.000.

Giger, Urs; and Perucchi, Norberto, to Eta A.G. Ebauches-Fabrik. Motor for electronic watch. 4,277,704, Cl. 310-49.00R.

Ginsberg, Thomas; and Kaufman, Lawrence G., to Union Carbide Corporation. Single-package zinc-rich coatings. 4,277,284, Cl. 106-1.050.

Girgis, Mikhail M., to PPG Industries, Inc. Modified phenolic aldehyde resin to produce an improved adhesive coating and method of making same. 4,277,535, Cl. 428-389.000.

Givaudan Corporation: *See*—
Helmlinger, Daniel; and Naegeli, Peter, 4,277,618, Cl. 560-231.000.
Oppolzer, Wolfgang, 4,277,631, Cl. 568-817.000.

Glassman, David M. Telephone monitoring apparatus. 4,277,648, Cl. 179-7.10R.

Glaxo Group Limited: *See*—
Thompson, Eric; and Baalham, Christopher J., 4,277,601, Cl. 544-22.000.

Gobel, Wilhelm: *See*—
Beck, Manfred; and Gobel, Wilhelm, 4,277,579, Cl. 525-344.000.

Goldman, Max; and Stein, Arthur A., to Pathology Products, Ltd. Adsorbent enclosure for automatic tissue processors. 4,276,819, Cl. 98-115.0LH.

Gomi, Tohru: *See*—
Sakotani, Akio; and Gomi, Tohru, 4,277,346, Cl. 210-691.000.

Good, William R.: *See*—
Mueller, Karl F.; and Good, William R., 4,277,582, Cl. 525-421.000.

Goodman, Philip: *See*—
Kovac, Michael G.; Chleck, David J.; and Goodman, Philip, 4,277,742, Cl. 324-61.00R.

Goodman, Robert M., Jr.; and Dittman, William J., to Georgia Tech Research Institute. Microwave energy transmission system for around-the-mast applications. 4,277,789, Cl. 343-708.000.

Goodyear Aerospace Corporation: *See—*
Chin, Robert W.; and Krause, Walter J., 4,276,969, Cl. 188-218.0XL.

Gorbaty, Martin L.: *See—*
Schlosberg, Richard H.; and Gorbaty, Martin L., 4,277,327, Cl. 208-263.000.

Gordon, John H. Method and apparatus for pressure forming pipe bells. 4,277,231, Cl. 425-387.100.

Goto, Naohiro: *See—*
Nonaka, Yasuhiko; Goto, Naohiro; and Shidara, Keiichi, 4,277,515, Cl. 427-76.000.

Gottschalk, Klaus W. Flat cable conductor separating apparatus. 4,276,798, Cl. 83-430.000.

Goumondy, Jean-Pierre: *See—*
Duhayon, Jacques; Goumondy, Jean-Pierre; Leudet, Alain; and Rousseau, Jean-Claude, 4,277,363, Cl. 252-301.10W.

Gracia, Robert F.: *See—*
Fromson, Howard A.; and Gracia, Robert F., 4,277,555, Cl. 430-278.000.

Graham, Sandra I.: *See—*
Nyi, Kayson; and Graham, Sandra I., 4,277,319, Cl. 204-159.230.

Grant, Norman A., to Aminoil, USA, Inc. Process for producing methanol. 4,277,416, Cl. 518-703.000.

Graphtek, Inc.: *See—*
Hittel, Lorenz A.; and Yurcik, Raymond H., Jr., 4,277,732, Cl. 318-696.000.

Gray, Don N.; and Keyes, Melvin H., to Technicon Instruments Corporation. Enzyme immunoassays using immobilized reagents in a flowing stream. 4,277,560, Cl. 435-7.000.

Gray, Stanley; and Heshmat, Hooshang, to Mechanical Technology Incorporated. Support element for compliant hydrodynamic thrust bearing. 4,277,111, Cl. 308-9.000.

Grecksch, Hans: *See—*
Raasch, Hans; and Grecksch, Hans, 4,276,742, Cl. 57-263.000.

Greenwood, Sydney H., to Exxon Research & Engineering Co. Treatment of pitches in carbon artifact manufacture. 4,277,324, Cl. 208-45.000.

Greenwood, Sydney H. J., to Exxon Research & Engineering Co. Treatment of pitches in carbon artifact manufacture. 4,277,325, Cl. 208-45.000.

Gref, Hans; Hofmann, Hans; Zander, Werner; and Busch, Josef, to AGFA-Gevaert, A.G. Experimental plant for the coating and drying of material in the form of webs. 4,276,853, Cl. 118-643.000.

Grenier, Wilfred J., to General Industries, Inc. Fluid friction heater. 4,277,020, Cl. 237-1.00R.

Greulich, Kenneth R.: *See—*
Wakeman, William R.; Van Malderghem, Edmund G.; and Greulich, Kenneth R., 4,277,016, Cl. 229-69.000.

Griehl, Wolfgang: *See—*
Schmid, Eduard; and Griehl, Wolfgang, 4,277,433, Cl. 264-289.300.

Grima, Jean-Claude: *See—*
Duquenne, Michel G. A.; David, Guy A. J.; Grima, Jean-Claude; and Daguet, Jacques L., 4,277,843, Cl. 370-84.000.

Grimes, Patrick G.; and Zahn, Markus, to Exxon Research & Engineering Co. Shunt current elimination and device employing tunneled protective current. 4,277,317, Cl. 204-1.00R.

Grimes, Raymond M.: *See—*
Burnett, Stanley F.; Dunkley, Michael; Grimes, Raymond M.; and Parmee, Keith, 4,276,972, Cl. 192-4.00C.

Grissman Chemicals Limited: *See—*
Diethelm, Eugen, 4,277,399, Cl. 260-239.30T.

Griswold Controls: *See—*
Griswold, David E., 4,276,897, Cl. 137-218.000.

Griswold, David E., to Griswold Controls. Backflow prevention apparatus. 4,276,897, Cl. 137-218.000.

Groll, Manfred; Kuhnel, Werner; and Kuth, Robert, to Bayer Aktiengesellschaft. Process for dyeing and printing cellulose fibres. 4,277,245, Cl. 8-532.000.

Grollier, Jean-Francois: *See—*
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,277,581, Cl. 525-420.000.

Grosvernier, Claude-Arnold, to Compagnie Industrielle Radioelectrique. Method and apparatus for checking the width and parallelism of margins following the centering of a print with respect to a support. 4,277,176, Cl. 356-394.000.

Gruhier, Henri: *See—*
Sugier, Andre; Courty, Philippe; Deschamps, Andre; and Gruhier, Henri, 4,277,458, Cl. 423-437.000.

Grunner, Erich. Turntable apparatus for molding tires. 4,277,233, Cl. 425-588.000.

Gsell, Laurenz: *See—*
Farooq, Saleem; Ackermann, Peter; Drabek, Jozef; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,277,494, Cl. 424-305.000.

GTE Products Corporation: *See—*
Bauer, Claude J.; and Moore, Kenneth M., 4,277,641, Cl. 174-65.00R.
Keeffe, William M.; Koury, Frederic; and Gungle, W. Calvin, 4,277,714, Cl. 313-217.000.

Guenther, Bobby D.: *See—*
Upatnieks, Juris; Christensen, Charles R.; and Guenther, Bobby D., 4,277,137, Cl. 350-162.0SF.

Guggenbuhl, Walter, to Contraves AG. Method and circuit for producing measuring pulses in a particle analyzer. 4,277,743, Cl. 324-71.0CP.

Gungle, W. Calvin: *See—*
Keeffe, William M.; Koury, Frederic; and Gungle, W. Calvin, 4,277,714, Cl. 313-217.000.

Gunter & Cooke, Inc.: *See—*
Howe, James W., Jr, 4,276,678, Cl. 19-106.00R.

Gunther, Arnold. Floating roofs with magnetic seals. 4,276,991, Cl. 220-223.000.

Gupton, B. Frank; and Ulmer, Harry E., to Virginia Chemicals Inc. Byproduct recovery from a pentaerythritol waste stream. 4,277,620, Cl. 562-609.000.

Gustafson, Ralph W., to General Electric Company. Method of assembling components of a thermostat. 4,276,690, Cl. 29-602.00R.

Guthikonda, Ravindra N.: *See—*
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., 4,277,482, Cl. 424-263.000.

Guthrie, Roderick I. L.; and Mucciardi, Frank, to Guthrie, Roderick I. L. Method of melt dispersing a floatable solid additive in molten metal and a melt dispersible, floatable, solid additive therefor. 4,277,282, Cl. 75-53.000.

Guy F. Atkinson Company: *See—*
Nelson, Richard M., 4,277,223, Cl. 415-199.100.

Gyrex Corp.: *See—*
Schillke, Peter; and Walls, Robert R., 4,277,518, Cl. 427-96.000.

H-C Industries, Inc.: *See—*
Peller, William N., 4,277,431, Cl. 264-148.000.

Haaf, William R.; and Shank, Charles P., to General Electric Company. Impact modifier for thermoplastic compositions. 4,277,575, Cl. 525-89.000.

Haberstroh, Markus; and Bernardi, Herbert, to GAO Gesellschaft fur Automation und Organisation mbH. Process and apparatus for doing up sheet material with label tapes. 4,276,736, Cl. 53-399.000.

Haeberle, Russell J.: *See—*
Giachino, Joseph M.; Haeberle, Russell J.; and Crow, Joseph W., 4,277,814, Cl. 361-283.000.

Hagen, Helmut; Kohler, Rolf-Dieter; and Markert, Juergen, to BASF Aktiengesellschaft. Method of using 1,2-benzisothiazoles. 4,277,477, Cl. 424-251.000.

Hajime Industries, Ltd.: *See—*
Yoshida, Hajime, 4,277,802, Cl. 358-106.000.

Hajos, Zoltan G.; and Levine, Seymour, to Ortho Pharmaceutical Corporation. Total synthesis of 1RS,4SR,5RS-4-(4,8-dimethyl)-5-hydroxy-7-nonen-1-yl)-4-methyl-3,8-dioxabicyclo[3.2.1]octane-1-acetic acid. 4,277,401, Cl. 260-340.600.

Hakkinen, Taisto. Respirator apparatus. 4,276,876, Cl. 128-200.140.

Hall, George R.; and Hall, Robert J., to Norlin Industries, Inc. Duty cycle control apparatus. 4,277,697, Cl. 307-265.000.

Hall, Graham W.: *See—*
Davison, Joseph A.; Hall, Graham W.; Hodges, Newton J.; and Price, David W., 4,277,568, Cl. 521-68.000.

Hall, James B.: *See—*
Hancock, Robert J.; Burns, William A.; and Hall, James B., 4,277,844, Cl. 371-38.000.

Hall, Robert J.: *See—*
Hall, George R.; and Hall, Robert J., 4,277,697, Cl. 307-265.000.

Hall, Walter L.; Jaquiss, Donald B. G.; and Mark, Victor, to General Electric Company. Process for preparing polycarbonates using cyclic amidine catalysts. 4,277,598, Cl. 528-199.000.

Hallen Company: *See—*
Allen, Herbert, 4,276,789, Cl. 81-3.360.

Halliburton Company: *See—*
Ferguson, Lyndel G., 4,277,073, Cl. 279-1.0SJ.

Ham, Robert K., to Getty Synthetic Fuels, Inc. Anaerobic sampling method. 4,276,778, Cl. 73-864.430.

Hamai, Kyugo, to Nissan Motor Company, Limited. Diesel engine having a subchamber. 4,276,865, Cl. 123-569.000.

Hamamatsu T.V. Co, Ltd: *See—*
Alfano, Robert R.; and Schiller, Norman H., 4,277,669, Cl. 219-121.0LK.

Hamilton, James M.; and Porter, Arthur J., to Hughes Aircraft Company. Charge comparator output driver. 4,277,702, Cl. 307-304.000.

Hamilton, W. Duane, to American Optical Corporation. Mechanical counterbalance. 4,277,044, Cl. 248-571.000.

Hammann, Ingeborg: *See—*
Sirrenberg, Wilhelm; Klauke, Erich; Marhold, Albrecht; Hammann, Ingeborg; Stendel, Wilhelm; and Krehan, Ingomar, 4,277,499, Cl. 424-322.000.

Hammes, Theo: *See—*
Kimm, Otfried; Hammes, Theo; and Loebler, Peter, 4,276,988, Cl. 215-254.000.

Hammond, Donald J.: *See—*
Lin, Kingso C.; and Hammond, Donald J., 4,277,382, Cl. 260-29.20M.

Hanafy, Amin M., to Hewlett-Packard Company. Acoustic electric transducer with shield of controlled thickness. 4,277,711, Cl. 310-334.000.

Hanafy, Amin M., to Hewlett-Packard Company. Acoustic electric transducer with slotted base. 4,277,712, Cl. 310-334.000.

Hancock, Robert J.; Burns, William A.; and Hall, James B., to Storage Technology Corporation. Method of detecting and correcting errors in digital data storage systems. 4,277,844, Cl. 371-38.000.

Hanna, Clinton R. Stabilizing vehicles. 4,277,076, Cl. 280-112.00A.

Hans Kramer GmbH & Co. KG, Firma: *See—*
Dabrowski, Ralf, 4,277,456, Cl. 423-328.000.

Hansen, Everett T., to Continental Group, Inc., The. Dome tooling to eliminate tab protrusion of a can end. 4,276,843, Cl. 113-1.00F.

Hansen, Paul A. Automatic biaxial sun tracking mechanism for sun ray utilization devices. 4,277,132, Cl. 350-83.000.

Hanson, Bruce L.: *See—*
Wolvek, Sidney; and Hanson, Bruce L., 4,276,874, Cl. 128-1.00D.

Hanson, Donald W.; and Palmquist, William E., to St. Jude Medical, Inc. Heart valve prosthesis. 4,276,658, Cl. 3-1.500.
Hanson, Robert C., to Energy Systems, Incorporated. Control system and apparatus for producing compatible mixtures of fuel gases. 4,277,254, Cl. 48-180.00R.
Hara, Yasuhiko: *See*—
Karasaki, Koichi; and Hara, Yasuhiko, 4,277,175, Cl. 356-378.000.
Harcarufka, Rudolph E.: *See*—
Bliznak, John B.; and Harcarufka, Rudolph E., 4,277,511, Cl. 426-548.000.
Harding, Geoffrey, to U.S. Philips Corporation. Device for determining internal body structures by means of scattered radiation. 4,277,686, Cl. 250-445.00T.
Hardinge, Kevin. Medullary canal plug. 4,276,659, Cl. 3-1.900.
Hardwick, John P.: *See*—
Dinsdale, Jack; Parkins, David W.; and Hardwick, John P., 4,277,070, Cl. 369-248.000.
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, to Thomson-CSF. Liquid-crystal display device. 4,277,145, Cl. 350-351.000.
Haris, J. Wylie, Jr.: *See*—
Vance, John M., 4,276,950, Cl. 180-7.00P.
Harris Corporation: *See*—
Rosier, Charles D.; Pan, Jing-Jong; and Belcher, Donald K., 4,277,764, Cl. 333-24.00C.
Harris Hub Co., Inc.: *See*—
Mis, Frank J., 4,276,665, Cl. 5-184.000.
Harshaw Chemical Company, The: *See*—
Swinehart, Carl F., 4,277,303, Cl. 156-616.00R.
Hart, W. Howard; and Weber, Helmut E., to United States of America, Environmental Protection Agency. Antifouling window assembly. 4,277,131, Cl. 350-63.000.
Harvey, Dennis, to Plessey Handel und Investments AG. Vibratory atomizer. 4,277,025, Cl. 239-102.000.
Harvey, Philip C., to MKS Instruments, Inc. Wide range digital meter. 4,277,747, Cl. 324-78.00D.
Harwood, Philip C.; and Johnson, George H., to Dukane Corporation. Control circuit for piezoelectric ultrasonic generators. 4,277,710, Cl. 310-316.000.
Hasegawa, Gary K., to Continental Group, Inc., The. Easy-opening container with non-detach tab. 4,276,993, Cl. 220-269.000.
Hasegawa, Hidenobu: *See*—
Mori, Shun'ichiro; Kimata, Kunio; Aoygi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,670, Cl. 219-492.000.
Mori, Shunichiro; Kimata, Kunio; Aoyagi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,671, Cl. 219-494.000.
Haskér, Jan; Vervest, Johannes C. G.; Peters, Cornelis; and Vroomen, Laurentius C. J., to U.S. Philips Corporation. Low-pressure gas discharge lamp and method for making. 4,277,713, Cl. 313-203.000.
Haslmayr, Johann, to Voest-Alpine Aktiengesellschaft. Process of producing cool agglomerated solids. 4,277,235, Cl. 432-18.000.
Hata, Hideo: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,277,578, Cl. 525-211.000.
Hatakeyama, Yoshiharu: *See*—
Enomoto, Seikichiro; and Hatakeyama, Yoshiharu, 4,276,893, Cl. 132-83.00R.
Hauni-Werke Korber & Co Kg.: *See*—
Wahle, Gunter; and Heitmann, Uwe, 4,277,678, Cl. 250-223.00R.
Hauser, Arnold: *See*—
Schulte-Elte, Karl-Heinrich; Hauser, Arnold; and Ohloff, Gunther, 4,277,625, Cl. 568-341.000.
Hawken, Kenneth W.; and Janko, Bozidar, to Tektronix, Inc. Cathode ray tube having low voltage focus and dynamic correction. 4,277,722, Cl. 315-31.00R.
Haworth Mfg., Inc.: *See*—
Haworth, Richard G.; Wilson, Harold R.; and Tillmann, Ditmar K., 4,277,123, Cl. 339-22.00R.
Haworth, Richard G.; Wilson, Harold R.; and Tillmann, Ditmar K., to Haworth Mfg., Inc. Raceway structure for power panel. 4,277,123, Cl. 339-22.00R.
Hayakawa, Masatoshi: *See*—
Konno, Toshio; and Hayakawa, Masatoshi, 4,276,683, Cl. 29-25.420.
Hayashi, Hisao, to Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-Ten. Cartridge/carrier locking device for automatic gun. 4,276,707, Cl. 42-17.000.
Hayashi, Masaaki; Nagami, Koichi; Tsuneta, Kazuyoshi; and Kenmotusu, Nobuhiro, to Dai Nippon Toryo Co., Ltd. Aqueous cationic thermosetting urethane resin coating compositions. 4,277,383, Cl. 260-29.300.
Hayes, Thomas D.; and Jewell, William J., to Cornell Research Foundation, Inc. Combined biological-chemical detoxification of organics. 4,277,342, Cl. 210-609.000.
Heap, Peter, to IROPA (Textile Accessories) Ltd. Apparatus for folding garments such as shirts. 4,277,005, Cl. 223-37.000.
Heard, Charles B., Jr. Fireplace device. 4,276,870, Cl. 126-141.000.
Hebel, James B., to Smith International, Inc. Roller Belleville spring damper. 4,276,947, Cl. 175-321.000.
Hechler, Valentine, IV. Spray and foam dispensing nozzle. 4,277,030, Cl. 239-407.000.
Heckler & Koch GmbH: *See*—
Strobel, Herbert, 4,276,792, Cl. 82-1.00C.
Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,277,600, Cl. 528-204.000.
Hehr, Wilfried, to Blaupunkt-Werke GmbH. Large-area light source. 4,277,817, Cl. 362-31.000.
Heibein, Harry P.; Millington, Richard G.; Salvadore, John M.; Scott, Dean J.; and Sendelweck, Michael L., to International Business Machines Corporation. Field replaceable modules for ink jet head assembly. 4,277,790, Cl. 346-75.000.
Height Inc.: *See*—
Shinriki, Tatsuo, 4,277,183, Cl. 366-98.000.
Heinz, Carlo: *See*—
Legille, Edouard; and Heinz, Carlo, 4,277,273, Cl. 65-19.000.
Heitkamp, Dieter; and Wagener, Klaus, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method for the recovery of uranium dissolved in sea water. 4,277,345, Cl. 210-679.000.
Heitmann, Uwe: *See*—
Wahle, Gunter; and Heitmann, Uwe, 4,277,678, Cl. 250-223.00R.
Heller, Peter V. N. Record bearing assembly for encapsulation of a record member, capsule part for a record bearing assembly and method of fabrication of record bearing assembly. 4,276,704, Cl. 40-159.000.
Helmlinger, Daniel; and Naegeli, Peter, to Givaudan Corporation. 2-Substituted-1-acetoxy and hydroxy-1-methyl-cyclohexanes. 4,277,618, Cl. 560-231.000.
Helmrich, Hans, to Siemens Aktiengesellschaft. Floppy disc structure with rectangular casing. 4,277,810, Cl. 360-133.000.
Henggeler, Aldo; and Crottaz, Roland. Supporting rib arrangement for a lower ceiling which is to be suspended beneath a structure-fixed ceiling and method of using such supporting rib arrangement. 4,276,731, Cl. 52-484.000.
Henning, Brian C. R., to Black & Decker, Inc. Vegetation cutter. 4,276,737, Cl. 56-12.800.
Henschel, Arthur O., Jr. Multiple by-pass filter system. 4,277,336, Cl. 210-167.000.
Hercules Incorporated: *See*—
Matlack, Albert S., 4,277,372, Cl. 252-429.00B.
Scheve, Bernard J., 4,277,593, Cl. 526-279.000.
Hergart, P. Anders, to Unikat AB. Catalytic exhaust cleaner. 4,277,442, Cl. 422-119.000.
Herman Miller, Inc.: *See*—
Propst, Robert L.; and Propst, Paul L., 4,277,079, Cl. 280-411.00R.
Hermann, Gerson; Patel, Babubhai C.; and Patel, Sudhakerbhai B., to Apex Chemical Company, Inc. Flame resisting composition. 4,277,379, Cl. 252-608.000.
Hermann, Karl H.: *See*—
Dorsch, Hans-Lothar; and Hermann, Karl H., 4,277,396, Cl. 260-146.00R.
Herrmann, Berthold; and Lindenthal, Hans, to Voith Getriebe KG. High speed hydrodynamic brake. 4,276,970, Cl. 188-296.000.
Heshmat, Hooshang, to Mechanical Technology Incorporated. Stepped, split, cantilevered compliant bearing support. 4,277,112, Cl. 308-9.000.
Heshmat, Hooshang, to Mechanical Technology Incorporated. Composite material compliant bearing element. 4,277,113, Cl. 308-9.000.
Heshmat, Hooshang: *See*—
Gray, Stanley; and Heshmat, Hooshang, 4,277,111, Cl. 308-9.000.
Hesky, Hans; and Wunderer, Armin, to Hoechst Aktiengesellschaft. Process for the purification of gases containing radioactive substances. 4,277,256, Cl. 55-66.000.
Hessert, James E.; and Johnston, Chester C., Jr., to Phillips Petroleum Company. Treatment of subsurface gas-bearing formations to reduce water production therefrom. 4,276,935, Cl. 166-295.000.
Heuvelmans, Jean J.: *See*—
Couwenberg, Winston D.; Bouwknegt, Albert; Ligthart, Franciscus A. S.; and Heuvelmans, Jean J., 4,277,720, Cl. 313-485.000.
Hewlett-Packard Company: *See*—
Hanafy, Amin M., 4,277,711, Cl. 310-334.000.
Hanafy, Amin M., 4,277,712, Cl. 310-334.000.
Traub, Stefan, 4,277,749, Cl. 324-126.000.
Heywang, Hermann: *See*—
Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, 4,277,516, Cl. 427-81.000.
Heywood, Joseph R., to Heywood, Joseph Richard; and Ainsworth, Leonard Hastings. Automatic coin dispenser. 4,276,894, Cl. 133-5.00R.
Heywood, Joseph Richard: *See*—
Heywood, Joseph R., 4,276,894, Cl. 133-5.00R.
Hickman, Ronald P., to Tekron Licensing B.V. Multiple-purpose work unit. 4,276,955, Cl. 182-33.000.
Hicks, David M. Closures. 4,276,989, Cl. 215-270.000.
Hieronymus, Hans, to Siemens Aktiengesellschaft. Arrangement for cooling a superconduction magnet coil winding. 4,277,769, Cl. 335-216.000.
Higashiyama, Kazuhiro, to Nissan Motor Company, Limited. Computer-controlled exhaust gas recirculation system for internal combustion engine. 4,276,866, Cl. 123-571.000.
Hilger, Edwin T.: *See*—
Miller, James S.; Lauyans, Frank M.; and Hilger, Edwin T., 4,277,217, Cl. 414-395.000.
Hilton, Edward W. Adjustable chip breaker for a cutting tool. 4,277,206, Cl. 407-3.000.
Himmetsberger, Alois; and Wittmann, Heinz, to TMC Corporation. Safety ski binding. 4,277,083, Cl. 280-618.000.
Hinn, Werner, to RCA Corporation. Automatic kinescope biasing system with increased interference immunity. 4,277,798, Cl. 358-33.000.
Hirohata, Hyogo: *See*—
Nakata, Koreaki; Oita, Masahiro; and Hirohata, Hyogo, 4,277,543, Cl. 428-546.000.

Hitachi, Ltd.: *See*—
Abe, Kozin; Uozumi, Norihira; and Oishi, Kazuaki, 4,277,746, Cl. 324-72.000.
Kanehori, Keiichi; Horigome, Shinkichi; Katsumoto, Masayuki; and Arikawa, Yoshijiro, 4,277,452, Cl. 423-246.000.
Kaneko, Kazuo, 4,277,723, Cl. 315-39.770.
Karasaki, Koichi; and Hara, Yasuhiko, 4,277,175, Cl. 356-378.000.
Kawamura, Hiromitsu; Nakajima, Tokuyoshi; and Shibuya, Yoshimichi, 4,277,275, Cl. 65-43.000.
Koike, Norio; Takemoto, Iwao; Kubo, Masaharu; Sato, Kazuhiro; and Nagahara, Shusaku, 4,277,799, Cl. 358-44.000.
Nonaka, Yasuhiko; Goto, Naohiro; and Shidara, Keiichi, 4,277,515, Cl. 427-76.000.
Okuyama, Toshiaki; Kubota, Yuzuru; and Nagase, Hiroshi, 4,277,735, Cl. 318-766.000.
Tokuda, Hiroastu; Morinaga, Shigeki; and Nakamura, Hideo, 4,277,829, Cl. 364-431.000.
Tokunaga, Michio; and Kitano, Junjiro, 4,277,696, Cl. 307-255.000.
Ura, Mitsugu, 4,277,767, Cl. 335-210.000.
Wada, Takeshi; Ienaka, Masanori; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,277,703, Cl. 307-553.000.
Hitachi Metals, Ltd.: *See*—
Asanae, Masumi; and Noguchi, Kohji, 4,277,552, Cl. 430-122.000.
Hitachi Shipbuilding & Engineering Company Limited: *See*—
Yamamoto, Masahiko; and Nishino, Yoshinori, 4,277,688, Cl. 250-506.000.
Hittel, Lorenz A.; and Yurcik, Raymond H., Jr., to Graphtek, Inc. Low power stepping motor driver circuit and method. 4,277,732, Cl. 318-696.000.
Hizume, Akio: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.
Hoagland, John C., to Monsanto Company. Filter assembly. 4,277,338, Cl. 210-186.000.
Hochbein, David E.: *See*—
Turley, Bernard C.; and Hochbein, David E., 4,277,093, Cl. 294-83.00R.
Hodges, Newton J.: *See*—
Davison, Joseph A.; Hall, Graham W.; Hodges, Newton J.; and Price, David W., 4,277,568, Cl. 521-68.000.
Hoechst Aktiengesellschaft: *See*—
Burg, Karlheinz; Schmieder, Werner; and Wolters, Ernst, 4,277,577, Cl. 525-154.000.
Eichhorn, Wilfried, 4,277,592, Cl. 526-227.000.
Forsch, Manfred; Schaub, Wolfgang; and Gerhards, Hermann, 4,277,470, Cl. 424-246.000.
Fuchs, Otto, 4,277,397, Cl. 260-157.000.
Hesky, Hans; and Wunderer, Armin, 4,277,256, Cl. 55-66.000.
Kleinschmidt, Willi; and Bock, Hartmut, 4,277,657, Cl. 200-61.210.
Landauer, Franz; and Schaeffer, Georg, 4,277,421, Cl. 570-185.000.
Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, 4,277,246, Cl. 8-532.000.
Meidert, Helmut; Pressler, Wilfried; and Muller, Werner H., 4,277,606, Cl. 546-157.000.
Ruber, Klaus; and Zill, Karl, 4,276,682, Cl. 28-289.000.
Sinharay, Akhileswar; Stahler, Gerhard; and Bonin, Werner, 4,277,493, Cl. 424-304.000.
Hoehler, Thomas J.: *See*—
Smith, Charles A.; and Hoehler, Thomas J., 4,276,888, Cl. 128-706.000.
Hoekman, Earl B., to Minnesota Mining and Manufacturing Company. Apparatus for providing a time controlled output. 4,277,693, Cl. 307-141.000.
Hoffman, Roy L.: *See*—
Collins, Robert W.; Hoffman, Roy L.; Loen, Larry W.; Mitchell, Glen R.; and Soltis, Frank G., 4,277,826, Cl. 364-200.000.
Hoffmann-La Roche Inc.: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,277,610, Cl. 556-446.000.
Osadca, Modest, 4,277,248, Cl. 23-230.00M.
Hofmann, Hans: *See*—
Gref, Hans; Hofmann, Hans; Zander, Werner; and Busch, Josef, 4,276,853, Cl. 118-643.000.
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, to Schering Aktiengesellschaft. 11-Methylene steroids, their preparation and pharmaceutical preparations containing them. 4,277,468, Cl. 424-243.000.
Hofstein, Steven R., to World Medical Marketing Corporation. Foot exerciser. 4,276,887, Cl. 128-691.000.
Holan, George; and Walser, Reimund A., to Commonwealth Scientific and Industrial Research Organization. Insecticidal 1-(2-naphthyl)-cyclobutane carboxylate. 4,277,490, Cl. 424-282.000.
Holdsworth, Dennis W.; and Adler, Ernst, to Holdsworth, Dennis W. Mobile material distribution system. 4,277,022, Cl. 239-7.000.
Holland, Jack O. Pitch adjuster for valved brass instruments. 4,276,804, Cl. 84-394.000.
Holm, Olle: *See*—
Branden, Leif; Bruun, Jan F.; Holm, Olle; Mellgren, Ronnie E.; Ryr, Karl A.; Stromer, Carl-Axel; and Tronslien, Erling, 4,277,652, Cl. 179-100.00D.
Holmes, Allen B., to United States of America, Army. Fluidic pulser. 4,276,943, Cl. 175-40.000.
Holstein und Kappert GmbH: *See*—
Schwinghammer, Gunther, 4,277,349, Cl. 210-797.000.
Holt, Lyn: *See*—
Birt, David E.; and Holt, Lyn, 4,277,071, Cl. 369-84.000.
Honeywell Inc.: *See*—
Borken, Richard J., 4,277,681, Cl. 250-358.00R.
Chapin, Lawrey H.; and Maze, Robert O., 4,277,771, Cl. 340-27.0NA.
Nelson, Lorne W., 4,277,018, Cl. 236-46.00R.
Szonntagh, Eugene L., 4,276,913, Cl. 141-1.000.
Upton, Robert W., Jr., 4,277,134, Cl. 350-96.200.
Honeywell Information Systems Inc.: *See*—
Saunders, Robert C.; Au, Dean T.; Williams, W. Ray; and Zurek, Donald, 4,277,831, Cl. 364-481.000.
Honl, Wolf-Dieter: *See*—
Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, 4,277,036, Cl. 242-107.40A.
Hooper, John W.: *See*—
Buyniski, Joseph P.; Hooper, John W.; and Lim, Gary M. F., 4,277,605, Cl. 546-74.000.
Hopkins, Lamar. Environmentally degradable soap bar system. 4,277,358, Cl. 252-92.000.
Hori, Mitutaka. Expansion and contraction drive apparatus. 4,277,335, Cl. 210-159.000.
Horigome, Shinkichi: *See*—
Kanehori, Keiichi; Horigome, Shinkichi; Katsumoto, Masayuki; and Arikawa, Yoshijiro, 4,277,452, Cl. 423-246.000.
Horii, Hiroshi: *See*—
Mori, Shun'ichiro; Kimata, Kunio; Aoygi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,670, Cl. 219-492.000.
Mori, Shunichiro; Kimata, Kunio; Aoyagi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,671, Cl. 219-494.000.
Horiike, Yasuhiro; Okano, Haruo; Shibagaki, Masahiro; and Kadono, Katsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Ion source and ion etching process. 4,277,304, Cl. 156-643.000.
Hornbeck, Larry J., to Texas Instruments Incorporated. Piggyback readout stratified channel CCD. 4,277,792, Cl. 357-24.000.
Horne, Shek C., to Polymer Corporation, The. Bonded thermoplastic hose. 4,276,908, Cl. 138-125.000.
Horning, Thomas D.: *See*—
Rudy, Michael W.; Horning, Thomas D.; and Kraemer, Edward J., 4,277,190, Cl. 400-582.000.
Hornung, Robert M.; and Lebesnerais, Gerard M., to International Business Machines Corporation. Semiconductor integrated injection logic structure controlled by the injector. 4,277,701, Cl. 307-291.000.
Horvath, Richard A., to General Motors Corporation. Vehicle suspension strut with serviceable shock absorber. 4,276,971, Cl. 188-322.000.
Horwell, David C.; and Tupper, David E., to Lilly Industries Limited. Tetrahydroindoloisoquinolines. 4,277,480, Cl. 424-258.000.
Horwitz, Joshua, to Pacer Systems, Inc. Aircraft flight simulating trainer. 4,276,702, Cl. 434-47.000.
Hoshizaki Electric Co., Ltd.: *See*—
Kawasumi, Sakichi, 4,276,750, Cl. 62-137.000.
Hossack, James: *See*—
Lawrence, Simon G.; and Hossack, James, 4,277,288, Cl. 106-309.000.
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Nakayama, Muneo; Nishimura, Toshihiro; Nakane, Hisashi; Toda, Shozo; Hotta, Yoshio; and Minato, Mitsuaki, 4,277,525, Cl. 427-387.000.
Hough, Sherman C. Game apparatus. 4,277,066, Cl. 273-267.000.
Hoval Interliz AG: *See*—
Zdansky, Ewald, 4,277,337, Cl. 210-173.000.
Howard, Robert; Robinson, Prentice; and Vitale, Alexander F., to Centronics Data Computer Corp. Bidirectional carriage drive employing a closed loop belt drive means for printers and the like. 4,277,189, Cl. 400-320.000.
Howard, Thomas, to T.J.D. Industries, Ltd. Heat exchanger. 4,276,929, Cl. 165-145.000.
Howarth, John J.: *See*—
Larsen, Tor G.; and Howarth, John J., 4,277,177, Cl. 356-431.000.
Howe, James W., Jr, to Gunter & Cooke, Inc. Ring doffer. 4,276,678, Cl. 19-106.00R.
Howe, Steven C.: *See*—
Norton, Richard V.; Frank, Peter J.; Fisher, Dennis H.; and Howe, Steven C., 4,277,636, Cl. 585-14.000.
Hoya Glass Works, Ltd.: *See*—
Izumitani, Tetsuro; and Miyade, Eimei, 4,277,523, Cl. 427-294.000.
HPM Corporation: *See*—
Kruder, George A., 4,277,182, Cl. 366-89.000.
Hsu, Sheng T., to RCA Corporation. Method for forming buried contact complementary MOS devices. 4,276,688, Cl. 29-571.000.
Huber, Harvard C.: *See*—
Amy, J. A.; and Huber, Harvard C., 4,277,368, Cl. 252-408.000.
Hudson, John A.: *See*—
Nelson, Richard S.; Hudson, John A.; and Mazey, David J., 4,277,293, Cl. 148-175.000.
Hughes Aircraft Company: *See*—
Hamilton, James M.; and Porter, Arthur J., 4,277,702, Cl. 307-304.000.
Jensen, William E., 4,277,694, Cl. 307-221.00D.
Verzwyvelt, Scott A., 4,277,547, Cl. 429-251.000.
Hughes Tool Company: *See*—
Millsapps, Stuart C., Jr., 4,276,946, Cl. 175-228.000.
Hulford, David: *See*—
Nally, Robert B.; Akister, James F.; and Hulford, David, 4,277,776, Cl. 340-146.3AG.

Humberger, Roger B.: *See—*
Long, Gary L.; and Humberger, Roger B., 4,277,454, Cl. 423-320.000.
Hunck, Billie G.; and Nelson, Robert W., to Deere & Company. Flow control valve assembly with integrated torque and flow divider control. 4,276,896, Cl. 137-101.000.
Hunt, Frederick B., to Milwaukee Dustless Brush Co. Rotary broom for sweeper. 4,276,674, Cl. 15-182.000.
Hunter, John J. Coupling for lined pipe. 4,277,091, Cl. 285-55.000.
Hunyadi, Steve, to Castle Keep, Inc. Closure alarm with three-way switch. 4,277,781, Cl. 340-545.000.
Hurt, Frank K.; and Wellons, Edwin L., to Mefcor, Inc. Pump assembly. 4,276,981, Cl. 198-866.000.
Huslik, Winfried. Writing utensil with built-in stamp and stamp pad. 4,277,195, Cl. 401-195.000.
Huston, Larry: *See—*
Rasmussen, Glenn; Huston, Larry; Morse, Donald W.; Tsuchiya, Takuzo; Morrison, Clifton H.; Rustad, Stanley C.; and Eiden, Leo, 4,276,795, Cl. 83-42.000.
Hyltin, Tom M., to Commodore Electronics Limited. Switch scanning means for use with integrated circuits. 4,277,784, Cl. 340-711.000.
Iaquinta, Joseph. Smoking device with self contained lighting apparatus. 4,276,892, Cl. 131-185.000.
Ideal Toy Corporation: *See—*
Albert, Judith; and Beny, Janos, 4,276,714, Cl. 46-118.000.
Idenawa, Hiroyuki: *See—*
Ikesue, Masumi; Yano, Takashi; Tatsumi, Susumu; Idenawa, Hiroyuki; Nakamura, Isao; and Tani, Tatsuo, 4,277,163, Cl. 355-14.00R.
Ienaka, Masanori: *See—*
Wada, Takeshi; Ienaka, Masanori; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,277,703, Cl. 307-553.000.
Igarashi, Keiichi: *See—*
Yoshimoto, Takeo; Igarashi, Keiichi; Oda, Kengo; Ura, Masaaki; and Sato, Naoki, 4,277,624, Cl. 568-44.000.
Iizuka, Haruhiko: *See—*
Sugasawa, Fukashi; Iizuka, Haruhiko; and Matsumoto, Junichiro, 4,276,863, Cl. 123-481.000.
Iizuka, Yo; Midorikawa, Susumu, deceased (by Midorikawa, Taeko, heir); Midorikawa, Kiyoshi, heir; and Midorikawa, Yumi, heir, to Kureha Kagaku Kogyo Kabushiki Kaishi. Vinyl chloride resin and alkyl methacrylate resin processing aid composition. 4,277,573, Cl. 525-85.000.
Ikegami, Takeshi: *See—*
Deguchi, Masanobu; and Ikegami, Takeshi, 4,276,978, Cl. 198-654.000.
Ikesue, Masumi; Yano, Takashi; Tatsumi, Susumu; Idenawa, Hiroyuki; Nakamura, Isao; and Tani, Tatsuo, to Ricoh Company, Ltd. Variable magnification electrostatic copying machine. 4,277,163, Cl. 355-14.00R.
Iki, Tetsuo: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.
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Tatsumi, Susumu; Eda, Tadahiro; and Imai, Chikara, 4,277,549, Cl. 430-30.000.
Imai, Kazuo: *See—*
Kanamaru, Naokatu; Imai, Kazuo; and Fujino, Hisaaki, 4,277,340, Cl. 210-433.200.
Imed Corporation: *See—*
Jenkins, Jon A., 4,277,227, Cl. 417-63.000.
Imperial Chemical Industries Limited: *See—*
Worthington, Paul A.; Rathmell, William G.; and Skidmore, Anthony M., 4,277,469, Cl. 424-245.000.
Inamine, Shigeo; Matsuda, Toshio; and Shimomura, Takeo, to Kabushiki Kaisha Veno Seiyaku Oyo Kenkyo. Food additive composition and process for preparation thereof. 4,277,512, Cl. 426-549.000.
Inamoto, Yoshiaki; Osugi, Motoyoshi; and Kashihara, Eiji, to Kao Soap Co., Ltd.; and Sumitomo Chemical Industries Ltd. 4-Homoisotwistane-aminoacid amides. 4,277,473, Cl. 424-248.540.
Incom International Inc.: *See—*
McCloskey, Albert R., 4,277,118, Cl. 308-238.000.
Independent Broadcasting Authority: *See—*
Baldwin, John L. E., 4,277,807, Cl. 360-32.000.
Industrial Designs & Services: *See—*
Crane, Walton B., 4,277,015, Cl. 229-23.00C.
Ing. C. Olivetti & C., S.p.A.: *See—*
Garziera, Gastone; and Pisani, Federico, 4,277,835, Cl. 364-900.000.
Ingersoll-Rand Company: *See—*
Webb, Paul D.; Kiefer, William J.; and Aumick, James M., 4,276,960, Cl. 184-6.220.
Ingram, James A.: *See—*
Kuntz, David H.; and Ingram, James A., 4,276,889, Cl. 128-761.000.
Inheed Pty. Ltd.: *See—*
Wright, Douglas C.; and Roberts, Sidney N., 4,277,330, Cl. 209-459.000.
Inks, Clyde G.; Compton, John W.; Ellerman, Kathryn M.; and Bergman, Lee H., to BASF Wyandotte Corporation. Freeze modification agent. 4,277,520, Cl. 427-220.000.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,277,668, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. High-frequency power feeder circuitry and supply method for electrical discharge machining. 4,277,668, Cl. 219-69.00M.
Institut Francais du Petrole: *See—*
Courty, Philippe; Miquel, Jean; Martino, Germain; and Convers, Alain, 4,277,369, Cl. 252-415.000.
Sugier, Andre; Courty, Philippe; Deschamps, Andre; and Gruhier, Henri, 4,277,458, Cl. 423-437.000.
Van Landeghem, Hugo, 4,277,444, Cl. 422-191.000.
Institut International de Pathologie Cellulaire et Moleculaire: *See—*
Trouet, Andre, 4,277,466, Cl. 424-180.000.
Instructional/Communications Technology, Inc.: *See—*
Taylor, Stanford E., 4,277,152, Cl. 352-17.000.
International Business Machines Corporation: *See—*
Brown, David J.; Walther, Ronald G.; Williams, Thomas W.; and Wrigglesworth, Michael D., 4,277,699, Cl. 307-272.00R.
Davis, Glenn W.; and Fleek, Arthur E., 4,277,191, Cl. 400-582.000.
Dunn, Robert M.; Schulman, Martin D.; and Timko, Nicholas, Jr., 4,277,816, Cl. 361-384.000.
Dunning, Gordon R., 4,277,059, Cl. 271-23.000.
Heibein, Harry P.; Millington, Richard G.; Salvadore, John M.; Scott, Dean J.; and Sendelweck, Michael L., 4,277,790, Cl. 346-75.000.
Hornung, Robert M.; and Lebesnerais, Gerard M., 4,277,701, Cl. 307-291.000.
McDaniel, Robert F.; Prewarski, Mike; and Ramey, Leonard D., 4,277,188, Cl. 400-257.000.
Stuckert, Paul E., 4,277,837, Cl. 364-900.000.
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Aaras, Arne; Martinsen, Kjell M.; and Nakland, Rikard, 4,277,102, Cl. 297-411.000.
Inventa AG fur Forschung und Patentverwertung: *See—*
Schmid, Eduard; and Griehl, Wolfgang, 4,277,433, Cl. 264-289.300.
Iowa State University Research Foundation, Inc.: *See—*
Oulman, Charles S.; and Chriswell, Colin D., 4,277,635, Cl. 568-916.000.
IPM Corporation: *See—*
Pietrocini, Thomas W., 4,277,544, Cl. 428-547.000.
Irion, Leonhard: *See—*
Braun, Wolfgang; and Irion, Leonhard, 4,277,310, Cl. 176-50.000.
Iriuchijima, Kunio: *See—*
Kagami, Toshio; Saito, Yoshijiro; Matsushita, Shigeru; and Iriuchijima, Kunio, 4,277,388, Cl. 260-33.40R.
IROPA (Textile Accessories) Ltd.: *See—*
Heap, Peter, 4,277,005, Cl. 223-37.000.
Isaacson, Milton S., to Nu-Tech Industries, Inc. Actuator for heart pump. 4,277,706, Cl. 310-80.000.
Ishihara, Taketoshi: *See—*
Wada, Shinzi; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,277,150, Cl. 351-13.000.
ITT Industries, Inc.: *See—*
Pickel, Hajo, 4,276,965, Cl. 188-73.500.
ITW de France: *See—*
Morel, Henri, 4,276,806, Cl. 411-41.000.
Morel, Henri, 4,277,196, Cl. 403-3.000.
Ivanov, Jury P. Method for assembling hulls of vessels. 4,276,847, Cl. 114-65.00R.
Ivers, John T.: *See—*
Wicklund, Peter A.; and Ivers, John T., 4,277,510, Cl. 426-441.000.
Iwafune, Yasuo; and Iwai, Hideo, to Tokyo Kogaku Kakai Kabushiki Kaisha. Base board device for measuring instruments. 4,277,171, Cl. 356-153.000.
Iwai, Hideo: *See—*
Iwafune, Yasuo; and Iwai, Hideo, 4,277,171, Cl. 356-153.000.
Iwase, Takayuki: *See—*
Nakai, Toshio; Kuzuya, Susumu; Onoda, Hiroshi; Iwase, Takayuki; and Asai, Akira, 4,277,192, Cl. 400-671.000.
Iwata, Hidehito: *See—*
Tabuchi, Kenji; and Iwata, Hidehito, 4,277,003, Cl. 222-350.000.
Iwata, Masakatsu: *See—*
Shiga, Yoshinobu; Kage, Ryusuke; and Iwata, Masakatsu, 4,276,729, Cl. 52-209.000.
Iwata, Yoichi, to Akebono Brake Industry Co., Ltd. Caliper carrying structure of pin-slide type disc brake. 4,276,964, Cl. 188-73.300.
Izumitani, Tetsuro; and Miyade, Eimei, to Hoya Glass Works, Ltd. Method of preventing tarnishing of polished glass articles. 4,277,523, Cl. 427-294.000.
J. Hengstler K.G.: *See—*
Neher, Hans, 4,277,677, Cl. 235-109.000.
J. & J. Marquardt: *See—*
Riess, Axel, 4,277,661, Cl. 200-157.000.
J.M. Voith GmbH: *See—*
Pfalzer, Lothar; and Fischer, Siegbert, 4,277,328, Cl. 209-169.000.
J. P. Simpson and Co. (ALNWICK) Limited: *See—*
Simpson, Simon B., 4,277,505, Cl. 426-64.000.
J.P. Tool Ltd.: *See—*
Proulx, Sylvester E., 4,277,207, Cl. 407-15.000.
J. R. Simplot Company: *See—*
Long, Gary L.; and Humberger, Roger B., 4,277,454, Cl. 423-320.000.
Jaarsma, Frank C., to Celanese Corporation. Multi-compartment containers. 4,277,000, Cl. 222-142.400.
Jablonski, Werner: *See—*
Malick, Heinz; Jablonski, Werner; and Plum, Willi, 4,277,362, Cl. 252-301.10W.
Jackson, Kenneth M., to United States of America, Energy. Adjustable flow rate controller for polymer solutions. 4,276,904, Cl. 137-599.000.

Jackson, Norman C., to Standard Products Company, The. Protective and decorative molding having foam-filled channel. 4,277,526, Cl. 428-31.000.

Jackson, Ronald A.; and Maruscak, John, to Black & Decker Inc. Tool guide. 4,277,208, Cl. 408-14.000.

Jadlocki, Joseph F., Jr.: *See—*
Thompson, John S.; and Jadlocki, Joseph F., Jr., 4,277,507, Cl. 426-264.000.

Jaedicke, Wilfried, to Maul Lochkartengerate GmbH. Method for using a multiple input bin collating machine with a single output hopper. 4,277,057, Cl. 270-58.000.

Jaeken, Jan; and Verhecken, Andre, to AGFA-Gevaert N.V. Novel magenta-forming color couplers and their use in photography. 4,277,559, Cl. 430-549.000.

Jager, Gerhard; von Konig, Anita; Liebe, Werner; and Voigt, Armin, to AGFA-Gevaert, A.G. Photographic material containing a stabilizing agent. 4,277,557, Cl. 430-446.000.

Janko, Bozidar: *See—*
Hawken, Kenneth W.; and Janko, Bozidar, 4,277,722, Cl. 315-31.00R.

Janome Sewing Machine Co., Ltd.: *See—*
Takenoya, Hideaki; and Makabe, Hachiro, 4,276,840, Cl. 112-315.000.

Jansen, Martin B.: *See—*
Saliger, Kenneth C.; and Jansen, Martin B., 4,276,932, Cl. 166-214.000.

Janssen, Wilbur A.: *See—*
Sandberg, Glenn A.; and Janssen, Wilbur A., 4,276,753, Cl. 62-186.000.

Jaquiss, Donald B. G.: *See—*
Hall, Walter L.; Jaquiss, Donald B. G.; and Mark, Victor, 4,277,598, Cl. 528-199.000.

Jarman, Alonzo B.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,276,810, Cl. 91-449.000.
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,276,811, Cl. 91-449.000.

Jastrzebski, Michael B.; and Padwa, Allen R., to Monsanto Company. Process for preparing ABS polyblends. 4,277,574, Cl. 525-86.000.

Jaulmes, Christian, to Ateliers de la Motobecane. Two-cycle internal combustion engine. 4,276,858, Cl. 123-73.0CC.

Jay Boyce & Associates: *See—*
Boyce, Jay, 4,277,736, Cl. 318-811.000.

Jeanmaire, Michel P. H.: *See—*
Boudot, Jean E.; Roger, Francoise M. M.; and Jeanmaire, Michel P. H., 4,277,285, Cl. 106-52.000.

Jeffers, Frederick J.; and McClure, Richard J., to Eastman Technology, Inc. Magnetic recording using recording media having temperature dependent coercivity. 4,277,806, Cl. 360-16.000.

Jenkins, Eugene M. Inclination maintaining system for a discharge chute. 4,276,975, Cl. 193-10.000.

Jenkins, Jon A., to Imed Corporation. Apparatus for converting a pump to a controller. 4,277,227, Cl. 417-63.000.

Jennewein, Manfred A., to Sussman Bugeltechnik GmbH. Garment-hanging station on a conveyor. 4,276,995, Cl. 221-15.000.

Jensen, William E., to Hughes Aircraft Company. Charge coupled device variable divider with integrating well. 4,277,694, Cl. 307-221.00D.

Jentzsch, Arndt: *See—*
Johne, Hans; Jentzsch, Arndt; Schmidt, Lothar; Muller, Wolfgang; and Funke, Mandred, 4,276,827, Cl. 101-212.000.

Jeschke, Alfred: *See—*
Dangschat, Rainer; Jeschke, Alfred; Leichtl, Helmut; and Winkler, Wolfgang, 4,277,797, Cl. 358-21.00R.

Jessop, Thomas C.; and Smith, William L., to Eastman Kodak Company. Metering apparatus. 4,277,440, Cl. 422-100.000.

Jeter, David R., to Southwire Company. Quick adjusting elongated object guide. 4,277,011, Cl. 226-199.000.

Jewell, William J.: *See—*
Hayes, Thomas D.; and Jewell, William J., 4,277,342, Cl. 210-609.000.

Jilek, Franz: *See—*
Czepel, Hubert; Jilek, Franz; and Zochbauer, Heinz, 4,277,532, Cl. 428-244.000.

Joannou, Constantinos J. Automatic egg cooker. 4,276,820, Cl. 99-334.000.

John Dusenbery Company, Inc.: *See—*
Landskroener, Peter A.; Dusenbery, John F.; and Young, Roger W., 4,277,010, Cl. 226-95.000.

Johne, Hans; Jentzsch, Arndt; Schmidt, Lothar; Muller, Wolfgang; and Funke, Mandred, to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Operator safety device. 4,276,827, Cl. 101-212.000.

Johnson, Donovan E., to United States of America, Agriculture. Preparing entomocidal products with oligosporogenic mutants of bacillus thuringiensis. 4,277,564, Cl. 435-242.000.

Johnson, Frederick O., to Westinghouse Electric Corp. Converter apparatus. 4,277,825, Cl. 363-87.000.

Johnson, George H.: *See—*
Harwood, Philip C.; and Johnson, George H., 4,277,710, Cl. 310-316.000.

Johnson & Johnson: *See—*
Friedman, Norman J., 4,277,529, Cl. 428-211.000.

Johnson, Weldon K., to Kerr-McGee Coal Corporation. Articulate material transfer system. 4,277,215, Cl. 414-292.000.

Johnston, Chester C., Jr.: *See—*
Hessert, James E.; and Johnston, Chester C., Jr., 4,276,935, Cl. 166-295.000.

Johnston, David B. R.: *See—*
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., 4,277,482, Cl. 424-263.000.

Johnston, John D.: *See—*
Walter, Karl H.; Johnston, John D.; and Wetherley, Dennis, 4,277,253, Cl. 23-313.00R.

Jolly, Jean: *See—*
Warnant, Julien; and Jolly, Jean, 4,277,409, Cl. 260-397.450.

Jones, Dwight V., to General Electric Company. Control circuit for controlling quantity of heat to electrically heatable windshield. 4,277,672, Cl. 219-497.000.

Jones & Laughlin Steel Corporation: *See—*
Kerlin, Richard G.; Kossler, Henry T.; Koros, Peter J.; and Petrushka, Robert G., 4,277,279, Cl. 75-58.000.

Jones, Raymond D., to TII Industries, Inc. Excess voltage arrester. 4,277,812, Cl. 361-119.000.

Jordan, Arthur D., Jr.; and Lavelle, Joseph A., to Rohm and Haas Company. Plasticizer combination of alkylene oxide-alkyl phenol adduct and carboxylic acid ester, and caulking composition. 4,277,387, Cl. 260-29.70H.

Jordan, Diane E.: *See—*
Dent, Thomas H.; Jordan, Diane E.; King, William E.; and Rieger, Frank W., 4,276,856, Cl. 122-382.000.

Jordon, Michael A.: *See—*
Casper, William L.; Jordon, Michael A.; Caulkins, Craig S.; and Miller, Robert G., 4,276,733, Cl. 52-745.000.

Jorendal, Gunnar; and von Renteln, Adrian, to ASEA Aktiebolag. Regulating winding structure for transformer. 4,277,770, Cl. 336-60.000.

Judet, Henri: *See—*
Dore, Alain; and Judet, Henri, 4,276,698, Cl. 33-174.00L.

June, Robert F., Jr. Method of coating the interior surfaces of vehicles with polyvinyl acetate. 4,277,521, Cl. 427-236.000.

Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-Ten: *See—*
Hayashi, Hisao, 4,276,707, Cl. 42-17.000.

Kabushiki Kaisha Keiheisha: *See—*
Sasaki, Sei'ichi, 4,277,068, Cl. 273-324.000.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,276,828, Cl. 101-291.000.

Kabushiki Kaisha Veno Seiyaku Oyo Kenkyo: *See—*
Inamine, Shigeo; Matsuda, Toshio; and Shimomura, Takeo, 4,277,512, Cl. 426-549.000.

Kadono, Katsuo: *See—*
Horiike, Yasuhiro; Okano, Haruo; Shibagaki, Masahiro; and Kadono, Katsuo, 4,277,304, Cl. 156-643.000.

Kadyrov, Tokhrul A. O.: *See—*
Kuliev, Aladdin M. O.; Kadyrov, Tokhrul A. O.; Gaibov, Gjuloglan G. O.; Sinaisky, Anatoly G.; and Matiyasevich, Valentina N., 4,277,390, Cl. 260-37.0EP.

Kagami, Toshio; Saito, Yoshijiro; Matsushita, Shigeru; and Iriuchijima, Kunio, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin of hydrolyzed product of vinyl chloride copolymer for use in coating resin and process for preparing such resin. 4,277,388, Cl. 260-33.40R.

Kage, Ryusuke: *See—*
Shiga, Yoshinobu; Kage, Ryusuke; and Iwata, Masakatsu, 4,276,729, Cl. 52-209.000.

Kalfoglou, George: *See—*
Kudchadker, Mohan V.; Kalfoglou, George; and Whittington, Lawrence E., 4,276,933, Cl. 166-266.000.

Kallinger, Franz. Jacking apparatus. 4,277,052, Cl. 254-106.000.

Kalmbach, Debra S. K., to Dow Chemical Company, The. Process for purifying aryl-substituted mono-olefins. 4,277,637, Cl. 585-828.000.

Kalnoki-Kis, Tibor, to Union Carbide Corporation. Nonaqueous cell. 4,277,545, Cl. 429-48.000.

Kamada, Akira, to Kyoto Yakuhin Kogyo Kabushiki Kaisha; and Sawai Seiyaku Kabushiki Kaisha. Adjuvant for promoting absorption of therapeutically active substances through the digestive tract. 4,277,465, Cl. 424-178.000.

Kaminski, Stanley; Mansolillo, Robert D.; and Wilmer, Eugene A., to Congoleum Corporation. Randomly embossed surface covering. 4,277,427, Cl. 264-45.500.

Kammerer, Otto W., to Pileco, Inc. Apparatus for measuring the fall height of a pile driver ram. 4,277,676, Cl. 235-92.0PD.

Kamoda, Masaru: *See—*
Kataoka, Yushin; Matsuda, Masaaki; and Kamoda, Masaru, 4,277,566, Cl. 521-32.000.

Kamshitsky, Pavel V.: *See—*
Koshman, Vitaly I.; Petrichenko, Vladimir F.; and Kamshitsky, Pavel V., 4,277,766, Cl. 335-122.000.

Kanamaru, Naokatu; Imai, Kazuo; and Fujino, Hisaaki, to Toray Industries, Inc. Membrane separation module and apparatus for its production. 4,277,340, Cl. 210-433.200.

Kanamori, Kyozo: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.

Kane, William T., to Corning Glass Works. Oxygen sensor. 4,277,322, Cl. 204-195.00S.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Kato, Shingi; Ogawa, Nobuo; Kawanami, Norio; and Onda, Takashi, 4,277,426, Cl. 264-8.000.

Kanehori, Keiichi; Horigome, Shinkichi; Katsumoto, Masayuki; and Arikawa, Yoshijiro, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Carbon monoxide absorbing liquid. 4,277,452, Cl. 423-246.000.

Kaneko, Kazuo, to Hitachi, Ltd. Symmetrical magnetron with output means on center axis. 4,277,723, Cl. 315-39.770.

Kaneko, Takashi: *See—*
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,277,578, Cl. 525-211.000.

Kaneko, Yasutoski, to Nippon Gakki Seizo Kabushiki Kaisha. Covering wire tightening device composite strings of pianos. 4,276,805, Cl. 84-458.000.

Kanger, Feodor, to Dominion Engineering Works Limited. Wicket gate bearing seal. 4,277,221, Cl. 415-160.000.

Kanmoto, Yoshiaki: *See—*
Fukushima, Yoshio; and Kanmoto, Yoshiaki, 4,277,156, Cl. 354-25.000.

Kao Soap Co., Ltd.: *See—*
Inamoto, Yoshiaki; Osugi, Motoyoshi; and Kashihara, Eiji, 4,277,473, Cl. 424-248.540.
Minegishi, Yutaka; and Nishimura, Toshiro, 4,277,350, Cl. 252-8.800.
Tsujii, Kaoru; Saito, Naoyuki; and Kawai, Michio, 4,277,378, Cl. 252-546.000.

Kapanka, Harley L.: *See—*
Loose, Richard D.; and Kapanka, Harley L., 4,277,037, Cl. 242-107.40A.

Karasaki, Koichi; and Hara, Yasuhiko, to Hitachi, Ltd. Method and apparatus for inspecting printed wiring boards. 4,277,175, Cl. 356-378.000.

Karayannis, Nicholas M.; and Skryantz, John S., to Standard Oil Company (Indiana). Alpha-olefin polymerization catalyst. 4,277,370, Cl. 252-429.00B.

Kasahara, Nobuo; and Yamanobe, Kouji, to Ricoh Company, Ltd. Electrophotographic apparatus comprising density sensor means. 4,277,162, Cl. 355-14.00R.

Kashihara, Eiji: *See—*
Inamoto, Yoshiaki; Osugi, Motoyoshi; and Kashihara, Eiji, 4,277,473, Cl. 424-248.540.

Kashiwara, Tomokazu: *See—*
Yamaguchi, Tetsuo; and Kashiwara, Tomokazu, 4,277,055, Cl. 267-140.000.

Kast, Howard B., to General Electric Company. Simplified fail-fixed servovalve. 4,276,809, Cl. 91-417.00R.

Kastura, John L.; and Enyart, David O., to General Motors Corporation. Motor vehicle diagnostic and monitoring system. 4,277,772, Cl. 340-52.00F.

Katagiri, Masataka. Artificial bonelike graft and method for producing the same. 4,277,238, Cl. 433-201.000.

Kataoka, Yushin; Matsuda, Masaaki; and Kamoda, Masaru, to Sumitomo Chemical Company, Limited. Chelate resin prepared by aftertreatment of aminated resin with polyfunctional compound and amine. 4,277,566, Cl. 521-32.000.

Kato, Masao: *See—*
Oda, Yoshio; Yamabe, Masaaki; and Kato, Masao, 4,277,565, Cl. 521-31.000.

Kato, Shingi; Ogawa, Nobuo; Kawanami, Norio; and Onda, Takashi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method for production of coagulated synthetic polymer latex. 4,277,426, Cl. 264-8.000.

Kato, Yasuo: *See—*
Wada, Shinzi; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,277,150, Cl. 351-13.000.

Katsukawa, Heitaro: *See—*
Sakotani, Akio; and Gomi, Tohru, 4,277,346, Cl. 210-691.000.

Katsumoto, Masayuki: *See—*
Kanehori, Keiichi; Horigome, Shinkichi; Katsumoto, Masayuki; and Arikawa, Yoshijiro, 4,277,452, Cl. 423-246.000.

Katz, Eric R.: *See—*
Fisher, Robert D.; and Katz, Eric R., 4,277,809, Cl. 360-131.000.

Kaufman, Lawrence G.: *See—*
Ginsberg, Thomas; and Kaufman, Lawrence G., 4,277,284, Cl. 106-1.050.

Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, to Nippon Soken, Inc. Gas flow measuring apparatus. 4,276,773, Cl. 73-204.000.

Kawai, Kiyohisa: *See—*
Fujino, Masahiko; Shinagawa, Susumu; and Kawai, Kiyohisa, 4,277,394, Cl. 260-112.50R.

Kawai, Michio: *See—*
Tsujii, Kaoru; Saito, Naoyuki; and Kawai, Michio, 4,277,378, Cl. 252-546.000.

Kawakami, Yuichi, to Nippon Electric Co., Ltd. Composite random access memory providing direct and auxiliary memory access. 4,277,836, Cl. 364-900.000.

Kawamura, Atsushi, to Ricoh Company, Ltd. Anamorphic Fθ lens system. 4,277,128, Cl. 350-6.800.

Kawamura, Hiromitsu; Nakajima, Tokuyoshi; and Shibuya, Yoshimichi, to Hitachi, Ltd. Method for fabricating liquid crystal display element. 4,277,275, Cl. 65-43.000.

Kawanami, Norio: *See—*
Kato, Shingi; Ogawa, Nobuo; Kawanami, Norio; and Onda, Takashi, 4,277,426, Cl. 264-8.000.

Kawasaki Kasei Chemicals Ltd.: *See—*
Matsuura, Ryo; Matsuzaki, Katsumi; and Narita, Masao, 4,277,257, Cl. 55-85.000.

Kawasumi, Sakichi, to Hoshizaki Electric Co., Ltd. Flake ice vending machine. 4,276,750, Cl. 62-137.000.

Kearney, Mark B.; Mowery, Kenneth D.; and Pechous, L. Joseph, to General Motors Corporation. Engine knock control with knock pulse duration adjustment. 4,276,861, Cl. 123-425.000.

Kearney-National, Inc.: *See—*
Bingham, Allen H., 4,277,197, Cl. 403-104.000.

Keefe, Donald J.: *See—*
Rusch, Gordon K.; Keefe, Donald J.; and McDowell, William P., 4,277,308, Cl. 176-19.0EC.

Keeffe, William M.; Koury, Frederic; and Gungle, W. Calvin, to GTE Products Corporation. Metal halide arc discharge lamp having coiled coil electrodes. 4,277,714, Cl. 313-217.000.

Keene Corporation: *See—*
George, Richard F., 4,277,117, Cl. 308-199.000.

Keeton Enterprises, Inc.: *See—*
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,276,718, Cl. 47-1.500.
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,276,719, Cl. 47-1.500.

Keeton, Eugene G.: *See—*
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,276,718, Cl. 47-1.500.
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,276,719, Cl. 47-1.500.

Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., to Keeton Enterprises, Inc. Herbicide application. 4,276,718, Cl. 47-1.500.

Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., to Keeton Enterprises, Inc. Herbicide roller application. 4,276,719, Cl. 47-1.500.

Keeton, Lyle S.: *See—*
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,276,718, Cl. 47-1.500.
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,276,719, Cl. 47-1.500.

Keio Giken Kogyo Kabushiki Kaisha: *See—*
Mieda, Fumio, 4,276,802, Cl. 84-1.190.

Kellar, John D.; and Pereman, Gordon F., to PPG Industries, Inc. Method and apparatus for shaping glass sheets using deformable vacuum mold. 4,277,276, Cl. 65-106.000.

Keller, Hartmut; Krauth, Axel; Maier, Horst R.; Nink, Horst; Pohlmann, Hans J.; Reddig, Horst; and Siebels, Johann, to Rosenthal Technik AG. Refractory articles and composite metal-ceramic articles (cermets) prepared from a silicate-containing aluminum titanate. 4,277,539, Cl. 428-450.000.

Keller, Karlheinz; and Furer, Lotti, to Ciba-Geigy Corporation. Process for dyeing pre-cleaned cellulose fiber material. 4,277,247, Cl. 8-557.000.

Keller, Walter: *See—*
Zahner, Hans; Drautz, Hannelore; and Keller, Walter, 4,277,478, Cl. 424-258.000.

Kellner, Andrew. Steering device for a cycle. 4,276,787, Cl. 74-552.000.

Kelly, Cornelius J. N., to E-B Industries, Inc. Electrically conductive self-regulating article. 4,277,673, Cl. 219-528.000.

Kelly, Joseph D.: *See—*
Cherenko, Joseph; Frey, William I.; Kelly, Joseph D.; and Sokol, Larry S., 4,277,299, Cl. 156-242.000.

Kelsey-Hayes Company: *See—*
Ayers, David T., 4,276,966, Cl. 188-79.50P.

Kempf, Gerhard; and Kunz, Albert, to Evolution SA. Electronically controlled system for making a multiply effect yarn. 4,276,739, Cl. 57-91.000.

Kendall Company, The: *See—*
Marshall, Preston F., 4,276,681, Cl. 28-105.000.

Kenmotusu, Nobuhiro: *See—*
Hayashi, Masaaki; Nagami, Koichi; Tsuneta, Kazuyoshi; and Kenmotusu, Nobuhiro, 4,277,383, Cl. 260-29.300.

Kennecott Corporation: *See—*
Sweeting, Truett B., 4,277,269, Cl. 65-2.000.

Kennedy, Richard A., to General Motors Corporation. Two stage RF amplifier. 4,277,757, Cl. 330-300.000.

Kenney Manufacturing Company: *See—*
Comeau, Paul E., 4,276,920, Cl. 160-345.000.

Kenrich Petrochemicals, Inc.: *See—*
Sugerman, Gerald; and Monte, Salvatore J., 4,277,415, Cl. 260-429.500.

Kerey, Gyorgy: *See—*
Takacs, Istvan; Rudolf, Peter; Szabo, Bela; and Kerey, Gyorgy, 4,276,701, Cl. 34-109.000.

Kerkhoffs, Pieter L., to Stamicarbon, B.V. Preparation of fructose. 4,277,563, Cl. 435-99.000.

Kerlin, Richard G.; Kossler, Henry T.; Koros, Peter J.; and Petrushka, Robert G., to Jones & Laughlin Steel Corporation. Method and apparatus for dispensing a fluidized stream of particulate material. 4,277,279, Cl. 75-58.000.

Kern, Eugene F. Barbecue grill slab. 4,276,869, Cl. 126-41.00R.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Heitkamp, Dieter; and Wagener, Klaus, 4,277,345, Cl. 210-679.000.
Mallek, Heinz; Jablonski, Werner; and Plum, Willi, 4,277,362, Cl. 252-301.10W.

Kernforschungszentrum Karlsruhe GmbH: *See—*
Rohrbacher, Hans-Adolf, 4,277,779, Cl. 340-348.000.
Szecsi, Laszlo, 4,277,765, Cl. 333-99.00S.

Kerr-McGee Coal Corporation: *See—*
Johnson, Weldon K., 4,277,215, Cl. 414-292.000.

Kessler, Hansjuergen: *See*—
Falkenstein, Georg; and Kessler, Hansjuergen, 4,277,571, Cl. 521-164.000.
Kewley, Norman E.: *See*—
Fulmer, Norman C.; and Kewley, Norman E., 4,277,234, Cl. 431-361.000.
Key Tronic Corporation: *See*—
Sonderman, Ed L.; and Davis, Walter Z., 4,277,780, Cl. 340-365.00S.
Thomas, Robert J.; Piekarski, Michael; Morgan, Gary B.; Rank, John; Thurman, William O.; and Lerch, Donald C., 4,277,689, Cl. 250-567.000.
Keyes, Melvin H.: *See*—
Gray, Don N.; and Keyes, Melvin H., 4,277,560, Cl. 435-7.000.
Keystone Camera Corporation: *See*—
Zawodny, Arthur, 4,277,158, Cl. 354-197.000.
Keyworth, Donald A.; and Purpi, David C., to Tenneco Chemicals, Inc. Flame-retardant vinyl aromatic polymer compositions. 4,277,567, Cl. 521-56.000.
Kharitonovich, Mikhail V.: *See*—
Kozhevnikov, Vladislav A.; Kononov, Ivan V.; Maslennikov, Ivan E.; Platonov, Vladimir N.; Kharitonovich, Mikhail V.; Ustinov, deceased Viktor I.; and Ustinov, Klavdia G., administrator, 4,276,764, Cl. 72-275.000.
Khonsari, Ali M.: *See*—
Gelbein, Abraham P.; and Khonsari, Ali M., 4,277,630, Cl. 568-801.000.
Kiefer, William J.: *See*—
Webb, Paul D.; Kiefer, William J.; and Aumick, James M., 4,276,960, Cl. 184-6.220.
Kikuchi, Shoji; Yajima, Toshio; Kishi, Kenichi; Sasaki, Takashi; Mori, Keiichi; and Sato, Haruhiko, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic materials. 4,277,558, Cl. 430-542.000.
Kilberis, Harry. Keyless chuck. 4,277,074, Cl. 279-60.000.
Kilgore, H. Lee. Portable scaffold assembly with movable anchor. 4,276,957, Cl. 182-130.000.
Killig, Klaus; Lichtenberg, Wolfhart; and Schittenhelm, Rudolf, to Siemens Aktiengesellschaft. Tomographic apparatus for producing transverse layer images. 4,277,687, Cl. 250-445.00T.
Kimata, Kunio: *See*—
Mori, Shunichiro; Kimata, Kunio; Aoygi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,670, Cl. 219-492.000.
Mori, Shunichiro; Kimata, Kunio; Aoyagi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,671, Cl. 219-494.000.
Kimberly-Clark Corporation: *See*—
Lilaonitkul, Amnuey, 4,276,881, Cl. 128-263.000.
Kimm, Otfried; Hammes, Theo; and Loebler, Peter, to Mauser-Werke GmbH. Tamper-proof closure. 4,276,988, Cl. 215-254.000.
Kindler, Wilfried: *See*—
Rosenstock, Guenter; and Kindler, Wilfried, 4,277,791, Cl. 346-140.00R.
King, John L., Jr., to MWA Company. Water tank for submerged grinding system. 4,276,724. Cl. 51-266.000.
King, Robert D., to General Electric Company. Charge transfer device phased array beamsteering and multibeam beamformer. 4,277,787, Cl. 343-100.0SA.
King-Seeley Thermos Co.: *See*—
Christensen, Donald R.; and Stanford, Ralph F., 4,277,002, Cl. 222-349.000.
King, William E.: *See*—
Dent, Thomas H.; Jordan, Diane E.; King, William E.; and Rieger, Frank W., 4,276,856, Cl. 122-382.000.
Kirk-Duncan, Brian A. C. Faucets. 4,276,899, Cl. 137-327.000.
Kirkegaard, Allan K., to Anpartsselskab. Garden implement with a drum motor. 4,276,940, Cl. 172-42.000.
Kishi, Kenichi: *See*—
Kikuchi, Shoji; Yajima, Toshio; Kishi, Kenichi; Sasaki, Takashi; Mori, Keiichi; and Sato, Haruhiko, 4,277,558, Cl. 430-542.000.
Kishikawa, Shinobu: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.
Kitano, Junjiro: *See*—
Tokunaga, Michio; and Kitano, Junjiro, 4,277,696, Cl. 307-255.000.
Kitao, Ikuo: *See*—
Wada, Shinzi; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,277,150, Cl. 351-13.000.
Kiuchi, Mitsuyuki, to Matsushita Electric Industrial Co., Ltd. Induction heating apparatus with negative feedback controlled pulse generation. 4,277,667, Cl. 219-10.49R.
Klauke, Erich: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Marhold, Albrecht; Hammann, Ingeborg; Stendel, Wilhelm; and Krehan, Ingomar, 4,277,499, Cl. 424-322.000.
Kleesattel, Claus. Method and apparatus for the measurement of hardness testing indentations. 4,277,174, Cl. 356-372.000.
Kleiber, Joseph P., to Tropel, Inc. Multifaceted mirror and assembly fixture and method of making such mirror. 4,277,141, Cl. 350-299.000.
Klein, Wilhelm; Bausch, Max; and Eckert, Dieter, to Daimler-Benz Aktiengesellschaft. Motor vehicle with at least one door. 4,277,099, Cl. 296-146.000.
Kleinschmidt, Willi; and Bock, Hartmut, to Hoechst Aktiengesellschaft. Apparatus for determining the quantity of particles present in a container. 4,277,657, Cl. 200-61.210.
Klimenko, Alexandr S.; Emelyanov, Igor V.; Krylov, Anatoly A.; and Yantovsky, Semen A. Method and appliance for fire extinguishing in enclosed compartment. 4,276,938, Cl. 169-47.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Streicher, Kurt; and zur Nieden, Achim, 4,276,859, Cl. 123-196.00R.
Knackstedt, Wilhelm: *See*—
Beckmann, Rolf; and Knackstedt, Wilhelm, 4,277,538, Cl. 428-429.000.
Knaus, Ray. Hair grooming device. 4,277,193, Cl. 401-39.000.
Kneipp, Kenneth G.: *See*—
Sonnonstine, Terry J.; and Kneipp, Kenneth G., 4,277,551, Cl. 430-120.000.
Knoedler, Juergen: *See*—
Dinkelacker, Walter; and Knoedler, Juergen, 4,277,752, Cl. 324-399.000.
Knothe, Erich; Berg, Christoph; and Melcher, Franz J., to Sartorius GmbH. Electromagnetic force-compensating weighing appliance. 4,276,949, Cl. 177-212.000.
Knox, Walter H., III: *See*—
Matthews, Stephen B.; Loredo, Tomas A.; Knox, Walter H., III; and Simmons, Herman F., 4,277,594, Cl. 526-352.000.
Kobayashi, Isao: *See*—
Fujita, Hisao; Tanaka, Yasuhiko; Kobayashi, Isao; and Nakamura, Ken, 4,276,854, Cl. 118-689.000.
Kobayashi, Ryuichiro: *See*—
Onodera, Kaoru; Mizukura, Noboru; and Kobayashi, Ryuichiro, 4,277,553, Cl. 430-216.000.
Kobinger, Walter: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,277,487, Cl. 424-273.00R.
Koboshi, Sigeharu; Fushiki, Isamu; and Sakamoto, Kenro, to Konishiroku Photo Industry Co., Ltd. Process for treating light-sensitive silver halide color photographic materials. 4,277,556, Cl. 430-393.000.
Kodama, Mitsuo: *See*—
Tobioka, Masaaki; Kodama, Mitsuo; Asai, Tsuyoshi; and Yamamoto, Takaharu, 4,277,283, Cl. 75-238.000.
Koehler-Dayton, Inc.: *See*—
Weik, Kirby B., 4,277,043, Cl. 248-503.100.
Weik, Kirby B., 4,277,103, Cl. 297-457.000.
Koelmel, Carl F.: *See*—
Lovas, Joseph R.; Lovas, Paul J.; and Koelmel, Carl F., 4,276,693, Cl. 30-380.000.
Koenig, Karl E., to Monsanto Company. Ephedrine and pseudoephedrine precursors. 4,277,420, Cl. 560-24.000.
Koerber, Marvin A.: *See*—
Kutnyak, Thomas A.; Koerber, Marvin A.; and Wills, Henry K., 4,277,640, Cl. 174-47.000.
Kohama, Tokio: *See*—
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,276,773, Cl. 73-204.000.
Kohda, Akihide; and Kurosaki, Teikichi, to Nippon Zoki Pharmaceutical Co., Ltd. Treatment of allergic symptoms with propanone derivatives. 4,277,474, Cl. 424-248.570.
Kohler, Rolf-Dieter: *See*—
Hagen, Helmut; Kohler, Rolf-Dieter; and Markert, Juergen, 4,277,477, Cl. 424-251.000.
Koike, Norio; Takemoto, Iwao; Kubo, Masaharu; Sato, Kazuhiro; and Nagahara, Shusaku, to Hitachi, Ltd. Color solid-state imaging device. 4,277,799, Cl. 358-44.000.
Koike, Shigemitsu: *See*—
Tanno, Takashi; and Koike, Shigemitsu, 4,276,700, Cl. 33-179.50R.
Kojima, Hiroaki: *See*—
Ukihashi, Hiroshi; Yamabe, Masaaki; and Kojima, Hiroaki, 4,277,586, Cl. 526-93.000.
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, to Daiichi Radioisotope Laboratories, Ltd. Cortisol radioimmunoassay method and cortisol derivatives usefu therefor. 4,277,460, Cl. 424-1.000.
Koletar, Gabor I.: *See*—
DuPont, Regis; Lardenois, Patrick; Morel, Claude; Frost, Jonathan; and Koletar, Gabor I., 4,277,476, Cl. 424-250.000.
Kondo, Shiro; and Akazawa, Michitada, to Alps Electric Co., Ltd. Illuminated push-button electrical switch. 4,277,665, Cl. 200-314.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Fujita, Hisao; Tanaka, Yasuhiko; Kobayashi, Isao; and Nakamura, Ken, 4,276,854, Cl. 118-689.000.
Kikuchi, Shoji; Yajima, Toshio; Kishi, Kenichi; Sasaki, Takashi; Mori, Keiichi; and Sato, Haruhiko, 4,277,558, Cl. 430-542.000.
Koboshi, Sigeharu; Fushiki, Isamu; and Sakamoto, Kenro, 4,277,556, Cl. 430-393.000.
Onodera, Kaoru; Mizukura, Noboru; and Kobayashi, Ryuichiro, 4,277,553, Cl. 430-216.000.
Konno, Toshio; and Hayakawa, Masatoshi, to CKD Corporation. Method for winding electrode foils and separators for capacitor. 4,276,683, Cl. 29-25.420.
Konoma, Kunihiko, to Minolta Camera Kabushiki Kaisha. Modified gauss type lens system. 4,277,149, Cl. 350-467.000.
Kononov, Ivan V.: *See*—
Kozhevnikov, Vladislav A.; Kononov, Ivan V.; Maslennikov, Ivan E.; Platonov, Vladimir N.; Kharitonovich, Mikhail V.; Ustinov, deceased Viktor I.; and Ustinov, Klavdia G., administrator, 4,276,764, Cl. 72-275.000.
Koppa, Daniel A.; and Aquino, Agostino J., to Nabisco, Inc. Rotary cutter for scoring dough sheets. 4,276,800, Cl. 83-863.000.

Koppe, Herbert: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,277,487, Cl. 424-273.00R.

Koppers, Manfred; Bohnes, Karlheinz; and Fitzgerald, Harry J., to Bochumer Eisenhutte Heintzmann GmbH & Co. Excavation roof support and method of installing the same. 4,277,204, Cl. 405-288.000.

Koros, Peter J.: *See—*
Kerlin, Richard G.; Kossler, Henry T.; Koros, Peter J.; and Petrushka, Robert G., 4,277,279, Cl. 75-58.000.

Koshman, Vitaly I.; Petrichenko, Vladimir F.; and Kamshitsky, Pavel V. Electric circuit switching device. 4,277,766, Cl. 335-122.000.

Kosmahl, Henry G., to United States of America, National Aeronautics and Space Administration. Multistage depressed collector for dual mode operation. 4,277,721, Cl. 315-5.380.

Kossler, Henry T.: *See—*
Kerlin, Richard G.; Kossler, Henry T.; Koros, Peter J.; and Petrushka, Robert G., 4,277,279, Cl. 75-58.000.

Koury, Frederic: *See—*
Keeffe, William M.; Koury, Frederic; and Gungle, W. Calvin, 4,277,714, Cl. 313-217.000.

Kovac, Michael G.; Chleck, David J.; and Goodman, Philip, to Panametrics, Inc. Absolute humidity sensors and methods of manufacturing humidity sensors. 4,277,742, Cl. 324-61.00R.

Koyama, Itsuji: *See—*
Nakajima, Hideiku; Koyama, Itsuji; Kusama, You; and Ashie, Yutaka, 4,277,524, Cl. 427-362.000.

Kozhevnikov, Vladislav A.; Kononov, Ivan V.; Maslennikov, Ivan E.; Platonov, Vladimir N.; Kharitonovich, Mikhail V.; Ustinov, deceased Viktor I.; and by Ustinov, Klavdia G., administrator. Die set for sizing sections. 4,276,764, Cl. 72-275.000.

Kraemer, Edward J.: *See—*
Rudy, Michael W.; Horning, Thomas D.; and Kraemer, Edward J., 4,277,190, Cl. 400-582.000.

Kraft, Derald H., to Dyneer Corporation. Hydraulic belt tensioner construction. 4,277,240, Cl. 474-110.000.

Kraftwerk Union Ag: *See—*
Braun, Wolfgang; and Irion, Leonhard, 4,277,310, Cl. 176-50.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Schabert, Hans-Peter, 4,277,309, Cl. 176-37.000.

Krage, Mark K.: *See—*
Faxvog, Frederick R.; and Krage, Mark K., 4,277,741, Cl. 324-58.50C.

Kransco Manufacturing, Inc.: *See—*
Fremont, Michael J., 4,276,844, Cl. 114-39.000.

Krause, Walter J.: *See—*
Chin, Robert W.; and Krause, Walter J., 4,276,969, Cl. 188-218.0XL.

Krauth, Axel: *See—*
Keller, Hartmut; Krauth, Axel; Maier, Horst R.; Nink, Horst; Pohlmann, Hans J.; Reddig, Horst; and Siebels, Johann, 4,277,539, Cl. 428-450.000.

Krehan, Ingomar: *See—*
Sirrenberg, Wilhelm; Klauke, Erich; Marhold, Albrecht; Hammann, Ingeborg; Stendel, Wilhelm; and Krehan, Ingomar, 4,277,499, Cl. 424-322.000.

Kriedt, Hans; and Fenk, Josef, to Siemens Aktiengesellschaft. Amplifier circuit arrangement for aperiodic signals. 4,277,756, Cl. 330-261.000.

Krieg, Werner. Device for simultaneously performing alignment and sighting operations. 4,277,169, Cl. 356-152.000.

Kristiansen, Odd: *See—*
Farooq, Saleem; Ackermann, Peter; Drabek, Jozef; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,277,494, Cl. 424-305.000.

Krohn, David A., to Eotec Corporation. Method of manufacture of optical fiber. 4,277,270, Cl. 65-3.00A.

Krohn, David A., to Eotec Corporation. Method of manufacturing graded index optical fibers. 4,277,271, Cl. 65-3.00A.

Kruder, George A., to HPM Corporation. Extruder with short cycle multichannel wave screw. 4,277,182, Cl. 366-89.000.

Krylov, Anatoly A.: *See—*
Klimenko, Alexandr S.; Emelyanov, Igor V.; Krylov, Anatoly A.; and Yantovsky, Semen A., 4,276,938, Cl. 169-47.000.

Kubica, Wladyslaw: *See—*
Schmidt, Oskar; and Kubica, Wladyslaw, 4,277,295, Cl. 156-117.000.

Kubicek, Donald H., to Phillips Petroleum Company. Conversion of alkane and/or cycloalkane thiols to disulfide with catalyst system comprised of cobalt molybdate and an alkali- or alkaline earth metal hydroxide. 4,277,623, Cl. 568-26.000.

Kubo, Masaharu: *See—*
Koike, Norio; Takemoto, Iwao; Kubo, Masaharu; Sato, Kazuhiro; and Nagahara, Shusaku, 4,277,799, Cl. 358-44.000.

Kubota, Yuzuru: *See—*
Okuyama, Toshiaki; Kubota, Yuzuru; and Nagase, Hiroshi, 4,277,735, Cl. 318-766.000.

Kudchadker, Mohan V.; Kalfoglou, George; and Whittington, Lawrence E., to Texaco Inc. Surfactant waterflood method for the recovery of oil. 4,276,933, Cl. 166-266.000.

Kudchadker, Mohan V.: *See—*
Allison, Jean B.; Kudchadker, Mohan V.; and Whittington, Lawrence E., 4,277,352, Cl. 252-8.55D.

Kuhfuss, Alvin L., Jr.; and Riediger, Craig W., to Caterpillar Tractor Co. Apparatus for installing vehicle components. 4,276,952, Cl. 180-294.000.

Kuhnel, Werner: *See—*
Groll, Manfred; Kuhnel, Werner; and Kuth, Robert, 4,277,245, Cl. 8-532.000.

Kuliev, Aladdin M. O.; Kadyrov, Tokhrul A. O.; Gaibov, Gjuloglan G. O.; Sinaisky, Anatoly G.; and Matiyasevich, Valentina N. Polymeric composition. 4,277,390, Cl. 260-37.0EP.

Kumahara, Yuichi: *See—*
Sakakibara, Shumpei; Kumahara, Yuichi; Okada, Yoshiaki; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tsushima, Shoichiro, 4,277,393, Cl. 260-112.50R.

Kumazawa, Toshihiko; Yamamoto, Takeshi; and Odanaka, Hiroshi, to Nippon Shokubai Kaguku Kogyo Co., Ltd. Process for the production of alkylene glycols. 4,277,632, Cl. 568-867.000.

Kumins, Charles A.; and Warford, Milan L., to Tremco, Inc. Waterproofing sheet material. 4,277,533, Cl. 428-332.000.

Kummer, Werner: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,277,487, Cl. 424-273.00R.

Kuntz, David H.; and Ingram, James A., to SHS Enterprises, Ltd. Urine specimen collecting device. 4,276,889, Cl. 128-761.000.

Kunz, Albert: *See—*
Kempf, Gerhard; and Kunz, Albert, 4,276,739, Cl. 57-91.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Enomoto, Satoru; Wada, Hisayuki; Nishita, Sadao; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,277,633, Cl. 568-879.000.

Kureha Kagaku Kogyo Kabushiki Kaishi: *See—*
Iizuka, Yo; Midorikawa, Susumu, deceased; Midorikawa, Kiyoshi, heir; and Midorikawa, Yumi, heir, 4,277,573, Cl. 525-85.000.

Kurkalov, Ivan I.: *See—*
Sika, Zigurd K.; Apsit, Voldemar V.; Daugulis, Khubert L.; and Kurkalov, Ivan I., 4,276,832, Cl. 104-292.000.

Kurosaki, Teikichi: *See—*
Kohda, Akihide; and Kurosaki, Teikichi, 4,277,474, Cl. 424-248.570.

Kurz, Craven H. Orthodontic instrument for applying elastic ligatures. 4,277,236, Cl. 433-3.000.

Kurzius, Karl A. Preparing yeast raised bakery products with glandless cotton-seed. 4,277,502, Cl. 426-20.000.

Kusama, You: *See—*
Nakajima, Hideiku; Koyama, Itsuji; Kusama, You; and Ashie, Yutaka, 4,277,524, Cl. 427-362.000.

Kuth, Robert: *See—*
Groll, Manfred; Kuhnel, Werner; and Kuth, Robert, 4,277,245, Cl. 8-532.000.

Kutnyak, Thomas A.; Koerber, Marvin A.; and Wills, Henry K., to Automation Industries, Inc. Electric current-carrying hose assembly having end fittings enclosing an electrical switch and/or a circuit-breaking device. 4,277,640, Cl. 174-47.000.

Kuzuya, Susumu: *See—*
Nakai, Toshio; Kuzuya, Susumu; Onoda, Hiroshi; Iwase, Takayuki; and Asai, Akira, 4,277,192, Cl. 400-671.000.

Kwasnoski, Daniel; and Sterner, Charles J., to Bethlehem Steel Corporation. Apparatus for distillation. 4,277,311, Cl. 202-183.000.

Kyoto Ceramic Kabushiki Kaisha: *See—*
Doi, Takao; and Nomura, Satoshi, 4,277,528, Cl. 428-192.000.

Kyoto Yakuhin Kogyo Kabushiki Kaisha: *See—*
Kamada, Akira, 4,277,465, Cl. 424-178.000.

La Telemecanique Electrique: *See—*
Vignaud, Jean C., 4,277,666, Cl. 200-328.000.

Laboratoire de Recherche API: *See—*
Monget, Daniel; and Nardon, Paul, 4,277,561, Cl. 435-14.000.

Laboratorios Bago S.A.: *See—*
Los, Mario A., 4,277,496, Cl. 424-309.000.

Lacefield, William B.; and Simon, Richard L., to Eli Lilly and Company. 1,1-Biphenyl-2-yl alkylamines, formulations and antiarrhythmic treatment. 4,277,471, Cl. 424-248.400.

Lacefield, William B.; and Simon, Richard L., to Eli Lilly and Company. Treating cardiac arrhythmias. 4,277,495, Cl. 424-309.000.

Ladin, Eli M., to Federal-Mogul Corp. Self-aligning clutch release bearing. 4,276,974, Cl. 192-98.000.

Laesser, Claude: *See—*
Saurer, Eric; Gharadjedaghi, Fereydoun; Laesser, Claude; Viennet, Rene; and Ruedin, Yves, 4,277,144, Cl. 350-349.000.

LaGrone, Charles H., to Garrett Corporation, The. Fuel control system. 4,276,743, Cl. 60-39.14R.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,276,776, Cl. 73-363.700.

Lalancette, Jean M., to Societe Nationale de l'Amiante. Calcined polyhydroxysilicate polymer reaction product. 4,277,596, Cl. 528-106.000.

Lalancette, Jean-Marc, to Societe Nationale de l'Aminate. Dry reaction process of asbestos tailings and ammonium sulfate. 4,277,449, Cl. 423-167.000.

Lalanne, Andre P., to Societe Anonyme Automobiles Citroen; and Societe dite: Automobile Peugeot. Vehicle having a rear deck for covering a luggage boot. 4,277,097, Cl. 296-37.160.

L'Allemand, Charles C., to Cly-Del Manufacturing Company, The. Method of making a hollow article. 4,277,298, Cl. 156-199.000.

Lamont, James: *See—*
Li, Thomas Z.; and Lamont, James, 4,277,410, Cl. 260-404.000.

Landauer, Franz; and Schaeffer, Georg, to Hoechst Aktiengesellschaft. Process for the manufacture of para-tert.butylbenzaldehyde and its derivatives which are halogen-substituted at the nucleus. 4,277,421, Cl. 570-185.000.

Landskroener, Peter A.; Dusenbery, John F.; and Young, Roger W., to John Dusenbery Company, Inc. Vacuum roller for transporting a web. 4,277,010, Cl. 226-95.000.

Langenstein, Joseph G., to Caterpillar Tractor Co. Boot seal. 4,276,786, Cl. 74-491.000.

Langer, Arthur W., Jr., to Exxon Research & Engineering Co. Polymerization of alpha-olefins with novel $T_nMR'_{3-n}$ cocatalysts. 4,277,590, Cl. 526-127.000.

Lankro Chemicals Limited: *See*—
Binns, John S.; Braithwaite, Malcolm J.; and Dignum, George, 4,277,629, Cl. 568-779.000.

Lapeyre, James M., to Laitram Corporation, The. Temperature/pressure transducer. 4,276,776, Cl. 73-363.700.

Lardenois, Patrick: *See*—
DuPont, Regis; Lardenois, Patrick; Morel, Claude; Frost, Jonathan; and Koletar, Gabor I., 4,277,476, Cl. 424-250.000.

Larsen, Tor G.; and Howarth, John J., to Measurex Corporation. Apparatus to measure select properties of a moving sheet. 4,277,177, Cl. 356-431.000.

Lauderback, Sanford K.: *See*—
Swanson, Michael E.; and Lauderback, Sanford K., 4,277,386, Cl. 260-29.6RW.

Laure, George R., to Laure Prosthetics, Inc. Carpometacarpal thumb joint. 4,276,660, Cl. 3-1.910.

Laure Prosthetics, Inc.: *See*—
Laure, George R., 4,276,660, Cl. 3-1.910.

Laurel Bank Machine Co., Ltd.: *See*—
Fujii, Kiyoshi; Tsuji, Keiji; and Nishimoto, Seiya, 4,277,774, Cl. 340-146.30Q.
Miyazaki, Yorizo, 4,276,735, Cl. 53-212.000.
Uchida, Shinya, 4,277,119, Cl. 312-208.000.

Laurent, Henry: *See*—
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, 4,277,468, Cl. 424-243.000.

Lauterbach, Jerre F., to Cummins Engine Company, Inc. Bearing construction and retainer therefor. 4,277,116, Cl. 308-188.000.

Lauyans, Frank M.: *See*—
Miller, James S.; Lauyans, Frank M.; and Hilger, Edwin T., 4,277,217, Cl. 414-395.000.

Lavelle, Joseph A.: *See*—
Jordan, Arthur D., Jr.; and Lavelle, Joseph A., 4,277,387, Cl. 260-29.70H.

Lawrence, Mark. Leg stretching exercise. 4,277,062, Cl. 272-126.000.

Lawrence, Simon G.; and Hossack, James, to Ciba-Geigy Corporation. Fluidized granulation of pigments using organic granulating assistant. 4,277,288, Cl. 106-309.000.

Lawson, Kenneth D.; and Brown, Neil L., to Neil Brown Instruments Systems, Inc. Low-power magnetometer circuit with constant current drive. 4,277,751, Cl. 324-254.000.

Leader, Raymond E.: *See*—
Smith, Dale K.; Donich, Thomas G.; Dickerson, Bobby V.; and Leader, Raymond E., 4,277,845, Cl. 455-52.000.

Leandris, Serge, to Precision Mecanique Labinal. Device for feeding a work station with a series of articles, particularly electric wires, in a predetermined order. 4,276,996, Cl. 221-87.000.

Lear Siegler, Inc.: *See*—
Surprenant, Ronald J., 4,277,655, Cl. 179-170.00R.

Le Berre, Serge: *See*—
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,277,145, Cl. 350-351.000.

Lebesnerais, Gerard M.: *See*—
Hornung, Robert M.; and Lebesnerais, Gerard M., 4,277,701, Cl. 307-291.000.

Leclerc, Pierre: *See*—
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,277,145, Cl. 350-351.000.

Lectard, Alain; and Magrone, Robert, to Aluminum Pechiney. Process for removing titaniferous and silico-aluminous incrustations from surfaces. 4,277,289, Cl. 134-3.000.

Ledges Associates: *See*—
Radlove, Sol B., 4,277,504, Cl. 426-62.000.

Lee, Kee Dong: *See*—
Choi, Sam Kwon; and Lee, Kee Dong, 4,277,584, Cl. 525-437.000.

Lefebvre, Jean-Pierre, to Creusot-Loire. Device for holding in position the forward portion of an inflatable boat. 4,276,668, Cl. 9-2.00A.

Leger, Jean-Paul. Trolley storage. 4,276,831, Cl. 104-93.000.

Legille, Edouard; and Heinz, Carlo. Treatment and handling of metallurgical slag. 4,277,273, Cl. 65-19.000.

Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, to Hoechst Aktiengesellschaft. Process for the dyeing of cellulose fibers with reactive dyes according to the batchwise exhaustion method. 4,277,246, Cl. 8-532.000.

Lehmann, Joachim W.: *See*—
Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, 4,277,246, Cl. 8-532.000.

Lehmann, Werner: *See*—
Wanner, Karl; Lehmann, Werner; and Ranger, Ulrich, 4,276,941, Cl. 173-117.000.

Leichnitz, Kurt, to Dragerwerk Aktiengesellschaft. Method and device for determining the alcohol content of a person's breathing. 4,277,251, Cl. 23-232.00R.

Leichtl, Helmut: *See*—
Dangschat, Rainer; Jeschke, Alfred; Leichtl, Helmut; and Winkler, Wolfgang, 4,277,797, Cl. 358-21.00R.

Leighton, Stephen B., to United States of America, Health, Education and Welfare. Gear drive for seal-less counter current chromatography. 4,277,017, Cl. 233-25.000.

Leinfelt, Karl E., to Aktiebolaget Electrolux. Compressing arrangement for a dust container. 4,277,265, Cl. 55-302.000.

Leininger, Glen: *See*—
Covic, John; Leininger, Glen; and Carlson, Roland W., 4,277,685, Cl. 250-445.00T.

Leitner, Harald, to U.S. Philips Corporation. Method of and arrangement for adapting a hearing aid. 4,276,781, Cl. 73-647.000.

Le Maire, Henry T.: *See*—
Buchholz, Kenneth M.; and Le Maire, Henry T., 4,277,264, Cl. 55-294.000.

Lemmens, Alfons E.; and Gielen, Hendrik A. L., to Metallurgie Hoboken-Overpelt. Process and apparatus for the continuous casting of metal. 4,276,921, Cl. 164-4.000.

Lemmer, Alfred. Adjustable footrest. 4,277,660, Cl. 200-86.500.

Leonard, John P.: *See*—
Yates, Robert E.; Leonard, John P.; Alongi, Robert E.; Albanes, Wilfredo V.; and Bishop, Charles M., 4,277,038, Cl. 244-3.150.

Lepeska, Bohumir: *See*—
Waitkus, Phillip A.; and Lepeska, Bohumir, 4,277,583, Cl. 525-423.000.

Lerch, Donald C.: *See*—
Thomas, Robert J.; Piekarski, Michael; Morgan, Gary B.; Rank, John; Thurman, William O.; and Lerch, Donald C., 4,277,689, Cl. 250-567.000.

Leudet, Alain: *See*—
Duhayon, Jacques; Goumondy, Jean-Pierre; Leudet, Alain; and Rousseau, Jean-Claude, 4,277,363, Cl. 252-301.10W.

Leva, Max. Tower packing element. 4,277,425, Cl. 261-98.000.

LeVert, Francis E. Digital room light controller. 4,277,727, Cl. 315-155.000.

Levine, Seymour: *See*—
Hajos, Zoltan G.; and Levine, Seymour, 4,277,401, Cl. 260-340.600.

Levinson, Stephen E.; and Pirz, Frank C., to Bell Telephone Laboratories, Incorporated. Syntactic continuous speech recognizer. 4,277,644, Cl. 179-1.0SD.

Lewandowski, Raymond, to Cherry Electrical Products Corp. Switch blade with wiping contact action. 4,277,662, Cl. 200-242.000.

Lewis, David M. Building wall construction. 4,276,730, Cl. 52-221.000.

Lewis, Mack A., to Wilson Trailer Company. Telescoping reach rod for gate and ramp device with lift deck. 4,277,096, Cl. 296-24.00C.

Li, Thomas Z.; and Lamont, James, to Emery Industries, Inc. Process for the production of carboxylic amides using alkyltin catalysts. 4,277,410, Cl. 260-404.000.

Licht, Steven J., to Bell Telephone Laboratories, Incorporated. Simultaneous formation of garnet epilayer on a plurality of substrates. 4,277,519, Cl. 427-129.000.

Lichtenberg, Wolfhart: *See*—
Killig, Klaus; Lichtenberg, Wolfhart; and Schittenhelm, Rudolf, 4,277,687, Cl. 250-445.00T.

Liebe, Werner: *See*—
Jager, Gerhard; von Konig, Anita; Liebe, Werner; and Voigt, Armin, 4,277,557, Cl. 430-446.000.

Lieurance, Dennis W.: *See*—
Burgeson, John E.; and Lieurance, Dennis W., 4,277,768, Cl. 335-216.000.

Liftech Consultants, Inc.: *See*—
Casper, William L.; Jordon, Michael A.; Caulkins, Craig S.; and Miller, Robert G., 4,276,733, Cl. 52-745.000.

Ligthart, Franciscus A. S.: *See*—
Couwenberg, Winston D.; Bouwknegt, Albert; Ligthart, Franciscus A. S.; and Heuvelmans, Jean J., 4,277,720, Cl. 313-485.000.

Lilaonitkul, Amnuey, to Kimberly-Clark Corporation. Compact tampon applicator. 4,276,881, Cl. 128-263.000.

Lillie, Christian: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,277,487, Cl. 424-273.00R.

Lilly Industries Limited: *See*—
Horwell, David C.; and Tupper, David E., 4,277,480, Cl. 424-258.000.

Lim, Gary M. F.: *See*—
Buyniski, Joseph P.; Hooper, John W.; and Lim, Gary M. F., 4,277,605, Cl. 546-74.000.

Lin, Kingso C.; and Hammond, Donald J., to Owens-Corning Fiberglas Corporation. Stable aqueous emulsion of reactive polysiloxane and curing agent. 4,277,382, Cl. 260-29.20M.

Lincoln, Thomas C., to Malco. Releasable key arrangement for an electrical connector. 4,277,126, Cl. 339-186.00M.

Lindberg, Gunnar V. Transport arrangement for trays and the like. 4,277,216, Cl. 414-331.000.

Lindberg, Mats-Ove R.: *See*—
Sundkvist, Gustaf J.; Lundgren, Fred O.; Lindberg, Mats-Ove R.; and Bostrom, Erik A., 4,276,777, Cl. 73-864.810.

Lindegger, Eric X. Rollers including labyrinth seals. 4,277,114, Cl. 308-20.000.

Lindenthal, Hans: *See*—
Herrmann, Berthold; and Lindenthal, Hans, 4,276,970, Cl. 188-296.000.

Linder, Ernst: *See*—
Muller, Klaus; Maurer, Helmut; Linder, Ernst; Rieger, Franz; and Ziegler, Bodo, 4,277,323, Cl. 204-195.00S.

Lindner, Alfred; Volkamer, Klaus; and Wagner, Ulrich, to BASF Aktiengesellschaft. Isolation of 1,3-butadiene from a C4-hydrocarbon mixture. 4,277,314, Cl. 203-50.000.

Lindner, Alfred: *See*—
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,277,315, Cl. 203-51.000.

Lindsay Manufacturing Company: *See*—
Anderson, John L.; Davidson, John C.; Schaaf, Henry W.; and Meis, Charles H., 4,277,023, Cl. 239-11.000.

Lindstrom, Raimo: *See*—
Pejchal, Karel; Fritzon, Hans G.; and Lindstrom, Raimo, 4,276,912, Cl. 139-437.000.

Lindtveit, Herbert, to Sid Harvey, Inc. Flue damper and draft regulator. 4,276,871, Cl. 126-292.000.

Lipinski, Richard J., to Mogul Corporation. Water treatment to inhibit corrosion and scale and process. 4,277,359, Cl. 252-181.000.

Litton Business Systems, Inc.: *See*—
Beckman, Robert P., 4,277,198, Cl. 403-231.000.

Litton Systems, Inc.: *See*—
Burke, Robert V., 4,277,726, Cl. 315-98.000.

Livesay, J. D., to General Motors Corporation. Liquid accumulator. 4,276,756, Cl. 62-503.000.

Livesay, Richard E., to Caterpillar Tractor Co. Keeper assembly. 4,277,199, Cl. 403-317.000.

Ljung, Bo H. G., to Singer Company, The. Method and apparatus for casting a splat-cooled flexure member. 4,276,924, Cl. 164-130.000.

Ljung, Bo H. G.; and Ferriss, Lincoln S., to Singer Company, The. Ring laser gyroscope dither drive circuit. 4,277,173, Cl. 356-350.000.

Locke, James S.: *See*—
Arend, Inez F.; and Locke, James S., 4,277,650, Cl. 179-84.0VF.

Lockhart, James L. Pharmaceutical record and label system. 4,277,089, Cl. 282-27.00R.

Lockheed Corporation: *See*—
Marrs, Graham J.; Oliver, Richard J.; Potthast, Alfred J.; and Samuelson, Roland M., 4,277,041, Cl. 244-182.000.
Mershon, Butler A.; and Wilhelm, Keith A., 4,276,762, Cl. 72-13.000.

Loebler, Peter: *See*—
Kimm, Otfried; Hammes, Theo; and Loebler, Peter, 4,276,988, Cl. 215-254.000.

Loen, Larry W.: *See*—
Collins, Robert W.; Hoffman, Roy L.; Loen, Larry W.; Mitchell, Glen R.; and Soltis, Frank G., 4,277,826, Cl. 364-200.000.

Logan, Ted J., to Proctor & Gamble Company, The. Fractionation of triglyceride mixtures. 4,277,412, Cl. 260-428.500.

Logan, Ted J., to Procter & Gamble Company, The. Fractionation of alkyl carboxylate mixtures. 4,277,413, Cl. 260-428.500.

Logic Devices, Inc.: *See*—
Allen, Paul E., 4,277,435, Cl. 264-328.120.

Logie, James A.: *See*—
Blanning, Robert B.; Treadwell, Archie B.; and Logie, James A., 4,277,039, Cl. 244-3.160.

Long, Gary L.; and Humberger, Roger B., to J. R. Simplot Company. Methods for the control of excessive corrosion in phosphoric acid circuits. 4,277,454, Cl. 423-320.000.

Longhi, Giuliano: *See*—
Possati, Mario; and Longhi, Giuliano, 4,277,121, Cl. 312-320.000.

Loose, Richard D.; and Kapanka, Harley L., to General Motors Corporation. Lock bar release for inertia locking seat belt retractor. 4,277,037, Cl. 242-107.40A.

Loose, Winfield W.; and MacDougall, Alan R., to AMP Incorporated. Connector having wire-in-slot connecting means and crimped strain relief. 4,277,124, Cl. 339-99.00R.

L'Oreal: *See*—
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,277,581, Cl. 525-420.000.

Loredo, Tomas A.: *See*—
Matthews, Stephen B.; Loredo, Tomas A.; Knox, Walter H., III; and Simmons, Herman F., 4,277,594, Cl. 526-352.000.

Los, Mario A., to Laboratorios Bago S.A. Methods of treating mammals suffering from inflammation and pain. 4,277,496, Cl. 424-309.000.

Lourdeaux, Bernard, to Neyrpic. Mechanism including two cut-off devices in series. 4,276,905, Cl. 137-613.000.

Lovas, Joseph R.; Lovas, Paul J.; and Koelmel, Carl F., to Cyloflex, Inc. Portable board mill. 4,276,693, Cl. 30-380.000.

Lovas, Paul J.: *See*—
Lovas, Joseph R.; Lovas, Paul J.; and Koelmel, Carl F., 4,276,693, Cl. 30-380.000.

Lucas Industries Limited: *See*—
Anderson, Robert A., 4,276,963, Cl. 188-71.400.

Lucas, John M.; and Nayar, Raman, to Domtar Inc. Roughness sensor calibration. 4,276,766, Cl. 73-1.00R.

Lucas, Joseph E., to Marine Engineering Company, C. A. Tilt-up/jack-up off-shore drilling apparatus and method. 4,277,051, Cl. 254-106.000.

Luce, Carl T.: *See*—
Dowell, Terrence P.; Banks, Edwin L., Jr.; and Luce, Carl T., 4,276,967, Cl. 188-134.000.

Luck, Allan J.; Clarke, John T.; and Sutton, Roger F., to Masonite Corporation. Post-press molding of man-made boards to produce contoured furniture parts. 4,277,428, Cl. 264-118.000.

Lucker, Peter W.; and Wetzelsberger, Nikolaus. Vaginal contraceptive. 4,277,461, Cl. 424-44.000.

Ludemann, Heinz: *See*—
Nagel, Erich; Turcke, Rainer; and Ludemann, Heinz, 4,277,061, Cl. 271-302.000.

Lula, Remus A.; and Aggen, George, to Allegheny Ludlum Steel Corporation. Ferritic stainless steel substrate for catalytic system. 4,277,374, Cl. 252-446.000.

Lummus Company, The: *See*—
Apanel, George J., 4,277,405, Cl. 260-348.210.
Gelbein, Abraham P.; and Khonsari, Ali M., 4,277,630, Cl. 568-801.000.

Lundberg, Robert D.: *See*—
Bock, Jan; Makowski, Henry S.; and Lundberg, Robert D., 4,277,381, Cl. 260-23.50A.

Lundgren, Fred O.: *See*—
Sundkvist, Gustaf J.; Lundgren, Fred O.; Lindberg, Mats-Ove R.; and Bostrom, Erik A., 4,276,777, Cl. 73-864.810.

Lundgren, Roy L. Fan attachment for rocking chairs. 4,277,224, Cl. 416-58.000.

Lunn, Lawrence M. Energy allocator. 4,277,691, Cl. 307-35.000.

Lusi, Domenico F. Music scoring and musical staffs. 4,277,090, Cl. 283-47.000.

Lykes Pasco Packing Company: *See*—
de Fasselle, Robert J.; Baron, Richard D.; and Nottke, James E., 4,276,734, Cl. 53-77.000.

Lyon, William. Plant watering mat system. 4,276,720, Cl. 47-39.000.

Lyons, Jerry L., to Essex Cryogenics of Missouri Inc. High flow pressure relief valve. 4,276,901, Cl. 137-469.000.

Maag Gear Wheel & Machine Co. Ltd.: *See*—
Sterki, Armin; Sommer, Gerd R.; and Naegeli, Walter, 4,276,699, Cl. 33-179.50R.

Mabuchi, Kenichi, to Mabuchi Motor Co, Ltd. Multi-stage energy storage device. 4,276,716, Cl. 46-206.000.

Mabuchi Motor Co, Ltd: *See*—
Mabuchi, Kenichi, 4,276,716, Cl. 46-206.000.

MacDougall, Alan R.: *See*—
Loose, Winfield W.; and MacDougall, Alan R., 4,277,124, Cl. 339-99.00R.

Machida Endoscope Co., Ltd.: *See*—
Oku, Toshio, 4,277,168, Cl. 356-138.000.

Machlan, G. Richard: *See*—
Shah, Hashmuk G.; and Machlan, G. Richard, 4,277,436, Cl. 264-518.000.

Madelaine, Guy; and Pourprix, Michel, to Commissariat a l'Energie Atomique. Device for analyzing the activity of a radioactive aerosol as a function of the grain size distribution of its particles. 4,277,682, Cl. 250-380.000.

Madsen, Ernest L.; Zagzebski, James A.; Banjavic, Richard A.; and Burlew, Michele M., to Wisconsin Alumni Research Foundation. Phantom material and method. 4,277,367, Cl. 252-408.000.

Maeda Industries, Ltd.: *See*—
Ozaki, Nobuo, 4,277,077, Cl. 280-236.000.

Maggio, Edward T., to Syva Company. Kit for carrying out chemically induced fluorescence immunoassay. 4,277,437, Cl. 422-61.000.

Maghemite Inc.: *See*—
Cavanagh, Patrick E., 4,277,329, Cl. 209-212.000.

Mago, Blake F., to Union Carbide Corporation. Poly(alkylene oxide) composition. 4,277,366, Cl. 252-392.000.

Magrone, Robert: *See*—
Lectard, Alain; and Magrone, Robert, 4,277,289, Cl. 134-3.000.

Mahle, Howard C.; and Wesenberg, Kenneth L., to Nott Company. Barge loading device. 4,277,214, Cl. 414-139.000.

Maier, Alfred E.; and Ricci, Louis N., to Westinghouse Electric Corp. Circuit breaker structure. 4,277,664, Cl. 200-293.000.

Maier, Hans-Peter: *See*—
Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, 4,277,246, Cl. 8-532.000.

Maier, Horst R.: *See*—
Keller, Hartmut; Krauth, Axel; Maier, Horst R.; Nink, Horst; Pohlmann, Hans J.; Reddig, Horst; and Siebels, Johann, 4,277,539, Cl. 428-450.000.

Makabe, Hachiro: *See*—
Takenoya, Hideaki; and Makabe, Hachiro, 4,276,840, Cl. 112-315.000.

Makara, Gyorgy; Morlin, Andras; Fozo, Andras; and Fulop, Robert, to Futober Epuletgepeszeti Termekeket Gyarto Vallalat. Air distributor. 4,276,818, Cl. 98-40.00B.

Makowski, Henry S.: *See*—
Bock, Jan; Makowski, Henry S.; and Lundberg, Robert D., 4,277,381, Cl. 260-23.50A.

Malco: *See*—
Lincoln, Thomas C., 4,277,126, Cl. 339-186.00M.

Mallek, Heinz; Jablonski, Werner; and Plum, Willi, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of treating radioactively contaminated solvent waste. 4,277,362, Cl. 252-301.10W.

Malmin, Oscar. Cannula and process. 4,276,880, Cl. 128-221.000.

Mamula, Ronald S.; and Dotson, Samuel C., to Andco Incorporated. Swing scaffold for hot blast stove checker chamber relining. 4,276,956, Cl. 182-128.000.

Mansolillo, Robert D.: *See*—
Kaminski, Stanley; Mansolillo, Robert D.; and Wilmer, Eugene A., 4,277,427, Cl. 264-45.500.

Manzoni, Stephane. Vehicle rearview mirrors. 4,277,140, Cl. 350-288.000.

Mar, Clarence Y.; and Caruso, Michael J., to Texas Instruments Incorporated. Non-sequential counter. 4,277,675, Cl. 235-92.0MB.

Marchello, Barbara L.: *See*—
Marchello, John L.; and Marchello, Barbara L., 4,276,670, Cl. 9-337.000.

Marchello, John L.; and Marchello, Barbara L. Swimmer's floatation aid. 4,276,670, Cl. 9-337.000.

Margary, Riccardo: *See*—
Faldella, Roberto; and Margary, Riccardo, 4,276,747, Cl. 60-618.000.

Marhold, Albrecht: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Marhold, Albrecht; Hammann, Ingeborg; Stendel, Wilhelm; and Krehan, Ingomar, 4,277,499, Cl. 424-322.000.

Marietta, Cesar: *See*—
Moumaneix, Francis; and Marietta, Cesar, 4,277,031, Cl. 239-414.000.

Marine Engineering Company, C. A.: *See*—
Lucas, Joseph E., 4,277,051, Cl. 254-106.000.

Mark, Victor, to General Electric Company. Process for preparing polycarbonates using sterically hindered heterocycloaliphatic secondary amine catalysts. 4,277,597, Cl. 528-199.000.

Mark, Victor, to General Electric Company. Process for preparing polycarbonates using pyrrole catalysts. 4,277,599, Cl. 528-199.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Tetraphenolic compounds and polycarbonates containing the same. 4,277,600, Cl. 528-204.000.

Mark, Victor: *See*—
Hall, Walter L.; Jaquiss, Donald B. G.; and Mark, Victor, 4,277,598, Cl. 528-199.000.

Marker, Hannes. Device for connecting a sailmast to a sailboard. 4,276,848, Cl. 114-91.000.

Markert, Juergen: *See*—
Hagen, Helmut; Kohler, Rolf-Dieter; and Markert, Juergen, 4,277,477, Cl. 424-251.000.

Marrs, Graham J.; Oliver, Richard J.; Potthast, Alfred J.; and Samuelson, Roland M., to Lockheed Corporation. Aircraft cruise speed control system. 4,277,041, Cl. 244-182.000.

Marshall, Preston F., to Kendall Company, The. In an apparatus for forming biaxially oriented nonwoven fabrics. 4,276,681, Cl. 28-105.000.

Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Teche, Andre, to Roussel Uclaf. Process for the preparation of esters. 4,277,617, Cl. 560-124.000.

Martin, Barrie J., to Plessey Handel und Investments AG. Boiler control systems. 4,276,857, Cl. 122-448.00R.

Martin Marietta Corporation: *See*—
Blanning, Robert B.; Treadwell, Archie B.; and Logie, James A., 4,277,039, Cl. 244-3.160.

Martino, Germain: *See*—
Courty, Philippe; Miquel, Jean; Martino, Germain; and Convers, Alain, 4,277,369, Cl. 252-415.000.

Martinsen, Kjell M.: *See*—
Aaras, Arne; Martinsen, Kjell M.; and Nakland, Rikard, 4,277,102, Cl. 297-411.000.

Maruscak, John: *See*—
Jackson, Ronald A.; and Maruscak, John, 4,277,208, Cl. 408-14.000.

Maslennikov, Ivan E.: *See*—
Kozhevnikov, Vladislav A.; Kononov, Ivan V.; Maslennikov, Ivan E.; Platonov, Vladimir N.; Kharitonovich, Mikhail V.; Ustinov, deceased Viktor I.; and Ustinov, Klavdia G., administrator, 4,276,764, Cl. 72-275.000.

Masonite Corporation: *See*—
Luck, Allan J.; Clarke, John T.; and Sutton, Roger F., 4,277,428, Cl. 264-118.000.

Masuhara, Isao: *See*—
Wakabayashi, Ataru; and Masuhara, Isao, 4,277,451, Cl. 423-243.000.

Masui, Kiyoshi: *See*—
Sugiura, Takeo; Miyajima, Keiji; Nagatomo, Hideo; and Masui, Kiyoshi, 4,277,514, Cl. 427-1.000.

Materne, Carsten; and Betzing, Hans, to A. Nattermann & Cie. GmbH. 1.4-Dihydropyridine-derivatives with antihypertensive activity. 4,277,483, Cl. 424-263.000.

Mathauser, William R. Fishing rod with strike signalling apparatus. 4,276,711, Cl. 43-17.000.

Matiyasevich, Valentina N.: *See*—
Kuliev, Aladdin M. O.; Kadyrov, Tokhrul A. O.; Gaibov, Gjuloglan G. O.; Sinaisky, Anatoly G.; and Matiyasevich, Valentina N., 4,277,390, Cl. 260-37.0EP.

Matlack, Albert S., to Hercules Incorporated. Solid catalyst component for olefin polymerization. 4,277,372, Cl. 252-429.00B.

Matlock, Paul L.; and Sandner, Michael R., to Union Carbide Corporation. Electrochemical benzylic oxidations. 4,277,318, Cl. 204-78.000.

Matsuda, Masaaki: *See*—
Kataoka, Yushin; Matsuda, Masaaki; and Kamoda, Masaru, 4,277,566, Cl. 521-32.000.

Matsuda, Toshio: *See*—
Inamine, Shigeo; Matsuda, Toshio; and Shimomura, Takeo, 4,277,512, Cl. 426-549.000.

Matsumoto, Hiromitsu, to Yamaha Hatsukoki Kabushiki Kaisha. Internal combustion engine of fuel injection type. 4,276,862, Cl. 123-432.000.

Matsumoto, Junichiro: *See*—
Sugasawa, Fukashi; Iizuka, Haruhiko; and Matsumoto, Junichiro, 4,276,863, Cl. 123-481.000.

Matsunaga, Hideaki: *See*—
Saito, Toshihiro; Tsutsumi, Yukihiro; Arai, Shoji; and Matsunaga, Hideaki, 4,277,414, Cl. 260-429.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kiuchi, Mitsuyuki, 4,277,667, Cl. 219-10.49R.
Minakuchi, Hiroshi, 4,277,754, Cl. 328-133.000.
Mori, Shun'ichiro; Kimata, Kunio; Aoygi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,670, Cl. 219-492.000.
Mori, Shunichiro; Kimata, Kunio; Aoyagi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, 4,277,671, Cl. 219-494.000.
Nakata, Koreaki; Oita, Masahiro; and Hirohata, Hyogo, 4,277,543, Cl. 428-546.000.

Matsushita, Shigeru: *See*—
Kagami, Toshio; Saito, Yoshijiro; Matsushita, Shigeru; and Iriuchijima, Kunio, 4,277,388, Cl. 260-33.40R.

Matsuura, Ryo; Matsuzaki, Katsumi; and Narita, Masao, to Kawasaki Kasei Chemicals Ltd. Process for preventing scale deposition. 4,277,257, Cl. 55-85.000.

Matsuzaki, Katsumi: *See*—
Matsuura, Ryo; Matsuzaki, Katsumi; and Narita, Masao, 4,277,257, Cl. 55-85.000.

Matthews, Stephen B.; Loredo, Tomas A.; Knox, Walter H., III; and Simmons, Herman F., to Reynolds Metals Company. Heat shrinkable polyethylene film and method for its manufacture. 4,277,594, Cl. 526-352.000.

Mattson, Charles T. Hand tool spring compressor. 4,276,684, Cl. 29-227.000.

Maul Lochkartengerate GmbH: *See*—
Jaedicke, Wilfried, 4,277,057, Cl. 270-58.000.

Maurer, Helmut: *See*—
Muller, Klaus; Maurer, Helmut; Linder, Ernst; Rieger, Franz; and Ziegler, Bodo, 4,277,323, Cl. 204-195.00S.

Mauser-Werke GmbH: *See*—
Kimm, Otfried; Hammes, Theo; and Loebler, Peter, 4,276,988, Cl. 215-254.000.

May, Carl J., Jr., to Bell Telephone Laboratories, Incorporated. Multiple variable threshold speech detector. 4,277,645, Cl. 179-1.0SC.

Maze, Robert O.: *See*—
Chapin, Lawrey H.; and Maze, Robert O., 4,277,771, Cl. 340-27.0NA.

Mazey, David J.: *See*—
Nelson, Richard S.; Hudson, John A.; and Mazey, David J., 4,277,293, Cl. 148-175.000.

McCleary, Donald J. Multi-purpose rack and hitch for ATC. 4,277,008, Cl. 224-273.000.

McCloskey, Albert R., to Incom International Inc. Bearings with felted teflon liners. 4,277,118, Cl. 308-238.000.

McClure, Richard J.: *See*—
Jeffers, Frederick J.; and McClure, Richard J., 4,277,806, Cl. 360-16.000.

McConnell, Charles H.: *See*—
Dunstan, Phillip E.; and McConnell, Charles H., 4,276,976, Cl. 198-334.000.

McDaniel, Max P.; and Welch, Melvin B., to Phillips Petroleum Company. Sulfiding and reoxidation of chromium catalyst. 4,277,587, Cl. 526-106.000.

McDaniel, Robert F.; Prewarski, Mike; and Ramey, Leonard D., to International Business Machines Corporation. Direct keyboard controlled rack shift device for a single element typewriter. 4,277,188, Cl. 400-257.000.

McDonald, Ray S.; and Thompson, David L., to Medtronic, Inc. Battery monitor for digital cardiac pacemaker. 4,276,883, Cl. 128-419.0PT.

McDonnell Douglas Corporation: *See*—
Speakman, Eugene R., 4,277,200, Cl. 403-408.000.

McDowell, William P.: *See*—
Rusch, Gordon K.; Keefe, Donald J.; and McDowell, William P., 4,277,308, Cl. 176-19.0EC.

McGookin, Hugh R., to McGookin, Hugh R. Method and apparatus for measuring the level of semi-solid material. 4,276,774, Cl. 73-290.00B.

McIntyre, Donald B.; and McIntyre, Frederic S., to Acumeter Laboratories, Inc. Wide-band and continuous line adhesive applicator for cigarette filter attachment and the like. 4,277,301, Cl. 156-446.000.

McIntyre, Frederic S.: *See*—
McIntyre, Donald B.; and McIntyre, Frederic S., 4,277,301, Cl. 156-446.000.

McKenna, James F.; and Anderson, Douglas O., to United States Steel Corporation. Ascension pipe cleaning apparatus. 4,277,312, Cl. 202-241.000.

McKinney, James A., to United States of America, Navy. Transducer array release and pressure compensation system. 4,277,839, Cl. 367-155.000.

McKinzie, Howard L., to Getty Oil Company, Inc. Method of thermally insulating a wellbore. 4,276,936, Cl. 166-303.000.

McLaren, Keith G., to Australian Atomic Energy Commision. Ionizing radiation treatment of wool textiles with resin for shrink resistance. 4,277,242, Cl. 8-128.00A.

McNab, Ian R.; and Reichner, Philip, to Westinghouse Electric Corp. Environment and brushes for high-current rotating electrical machinery. 4,277,708, Cl. 310-228.000.

Mead Corporation, The: *See*—
Vedder, James L., 4,277,548, Cl. 430-22.000.

Measurex Corporation: *See*—
Larsen, Tor G.; and Howarth, John J., 4,277,177, Cl. 356-431.000.

Mechanical Technology Incorporated: *See*—
Gray, Stanley; and Heshmat, Hooshang, 4,277,111, Cl. 308-9.000.

Heshmat, Hooshang, 4,277,112, Cl. 308-9.000.
Heshmat, Hooshang, 4,277,113, Cl. 308-9.000.
Meckler, Gershon. Air bar assembly. 4,276,817, Cl. 98-38.00E.
Medrex Ltd.: *See—*
Zabik, Alexander J.; and Fisher, Stephen G., 4,277,153, Cl. 353-27.00R.
Medtronic, Inc.: *See—*
Dickhudt, Eugene A.; and Ray, Charles D., 4,276,882, Cl. 128-419.00P.
McDonald, Ray S.; and Thompson, David L., 4,276,883, Cl. 128-419.0PT.
Mefcor, Inc.: *See—*
Hurt, Frank K.; and Wellons, Edwin L., 4,276,981, Cl. 198-866.000.
Mehra, Yuv R.; and Clark, Ralph E., to El Paso Products Company. Recovery of 1,3-butadiene. 4,277,313, Cl. 203-32.000.
Meidert, Helmut; Pressler, Wilfried; and Muller, Werner H., to Hoechst Aktiengesellschaft. 8-Oxo-5,6,7,8-tetrahydro-2-quinolone and process for the preparation thereof. 4,277,606, Cl. 546-157.000.
Meier, Willi, to Dorina Nahmaschinen GmbH. Needle bar pendulum for sewing machines. 4,276,839, Cl. 112-227.000.
Meinert, Hartnut: *See—*
Wieland, Dieter; and Meinert, Hartnut, 4,276,769, Cl. 73-19.000.
Meis, Charles H.: *See—*
Anderson, John L.; Davidson, John C.; Schaaf, Henry W.; and Meis, Charles H., 4,277,023, Cl. 239-11.000.
Melcher, Franz J.: *See—*
Knothe, Erich; Berg, Christoph; and Melcher, Franz J., 4,276,949, Cl. 177-212.000.
Mellgren, Ronnie E.: *See—*
Branden, Leif; Bruun, Jan F.; Holm, Olle; Mellgren, Ronnie E.; Ryr, Karl A.; Stromer, Carl-Axel; and Tronslien, Erling, 4,277,652, Cl. 179-100.00D.
Mellors, Geoffrey W.; and Sheffield, Glenn W., to Union Carbide Corporation. Manganese dioxide. 4,277,360, Cl. 252-182.100.
Melnick, Joseph L.; and Wallis, Craig, to Baylor College of Medicine. Methods for detecting and quantifying occult blood. 4,277,250, Cl. 23-230 00B.
Melton, Florence. Method of making a slipper sock. 4,276,671, Cl. 12-142.00T.
Memorex Corporation: *See—*
Fisher, Robert D.; and Katz, Eric R., 4,277,809, Cl. 360-131.000.
Meneghetti, Giorgio: *See—*
Alberto, Pietro; and Meneghetti, Giorgio, 4,277,032, Cl. 242-56.00R.
Menzi, Robert: *See—*
Rufer, Willy; and Menzi, Robert, 4,277,513, Cl. 426-656.000.
Mercer, Robert R., to General Motors Corporation. Apparatus for installing a ferrule. 4,277,012, Cl. 227-68.000.
Merck & Co., Inc.: *See—*
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., 4,277,482, Cl. 424-263.000.
Tolman, Richard L.; Ashton, Wallace T.; and Brown, Ronald D., 4,277,603, Cl. 544-250.000.
Woltersdorf, Otto W.; and Cragoe, Edward J., Jr., 4,277,602, Cl. 544-207.000.
Mershon, Butler A.; and Wilhelm, Keith A., to Lockheed Corporation. Joggling machine. 4,276,762, Cl. 72-13.000.
Messrs. O.M.G. Officina macchine Grafiche de pessina e Perobelli: *See—*
Perobelli, Aldo; and Pessina, Giorgio, 4,277,060, Cl. 271-186.000.
Metallurgie Hoboken-Overpelt: *See—*
De Schepper, Achille; and Van Peteghem, Antoine, 4,277,445, Cl. 422-259.000.
Lemmens, Alfons E.; and Gielen, Hendrik A. L., 4,276,921, Cl. 164-4.000.
Metcalf, Brian W.: *See—*
Bey, Philippe; Metcalf, Brian W.; and Wiseman, Jeffrey S., 4,277,395, Cl. 260-112.50R.
Metzenthin, Dieter W. Fuel atomizing device. 4,276,867, Cl. 123-590.000.
Meunier, Georges, to Saint Gobain Industries. Apparatus for distribution of solid particles. 4,277,205, Cl. 406-123.000.
Meyers, Gary W.: *See—*
Reed, Russell, Jr.; Moore, Kenneth L.; and Meyers, Gary W., 4,277,203, Cl. 405-264.000.
Michel, Edmond, to Solvay & Cie. Hollow body made of an oriented thermoplastic. 4,276,987, Cl. 215-1.00C.
Michel, Joseph P., to Anciaux widow Wastesaeger, Martine, a part interest. Method of producing cross-linked, unsaturated polyesters. 4,277,570, Cl. 521-106.000.
Midorikawa, Kiyoshi, heir: *See—*
Iizuka, Yo; Midorikawa, Susumu, deceased; Midorikawa, Kiyoshi, heir; and Midorikawa, Yumi, heir, 4,277,573, Cl. 525-85.000.
Midorikawa, Susumu, deceased: *See—*
Iizuka, Yo; Midorikawa, Susumu, deceased; Midorikawa, Kiyoshi, heir; and Midorikawa, Yumi, heir, 4,277,573, Cl. 525-85.000.
Midorikawa, Taeko, heir: *See—*
Iizuka, Yo; Midorikawa, Susumu, deceased; Midorikawa, Kiyoshi, heir; and Midorikawa, Yumi, heir, 4,277,573, Cl. 525-85.000.
Midorikawa, Yumi, heir: *See—*
Iizuka, Yo; Midorikawa, Susumu, deceased; Midorikawa, Kiyoshi, heir; and Midorikawa, Yumi, heir, 4,277,573, Cl. 525-85.000.
Mieda, Fumio, to Keio Giken Kogyo Kabushiki Kaisha. Electronic keyboard instrument. 4,276,802, Cl. 84-1.190.
Miko, Richard J.; and Shapiro, Daniel H., to Edo Corporation. Reusable helical filter for high temperature gases. 4,277,261, Cl. 55-278.000.
Miko, Richard J.; and Shapiro, Daniel H., to Edo Corporation. Reusable axial filter for high temperature gases. 4,277,262, Cl. 55-278.000.
Miles, Richard B. Laser beacon and optical detector system for aircraft collision hazard determination. 4,277,170, Cl. 356-152.000.
Miles, Wilbur N.: *See—*
Benjamin, Milton L.; and Miles, Wilbur N., 4,277,209, Cl. 408-139.000.
Miller, Alfred F.: *See—*
Sato, Kunito; Miller, Alfred F.; and Zimont, Leonard J., 4,277,508, Cl. 426-266.000.
Miller, James S.; Lauyans, Frank M.; and Hilger, Edwin T., to A-T-O Inc. Load transfer apparatus. 4,277,217, Cl. 414-395.000.
Miller, Robert F., to Allegheny Ludlum Steel Corporation. Electrical steel lamination. 4,277,530, Cl. 428-216.000.
Miller, Robert G.: *See—*
Casper, William L.; Jordon, Michael A.; Caulkins, Craig S.; and Miller, Robert G., 4,276,733, Cl. 52-745.000.
Millington, Richard G.: *See—*
Heibein, Harry P.; Millington, Richard G.; Salvadore, John M.; Scott, Dean J.; and Sendelweck, Michael L., 4,277,790, Cl. 346-75.000.
Mills, Anthony J.: *See—*
Webb, David; and Mills, Anthony J., 4,277,377, Cl. 252-522.00R.
Millsapps, Stuart C., Jr., to Hughes Tool Company. Biased lubricant compensator for an earth boring drill bit. 4,276,946, Cl. 175-228.000.
Milwaukee Dustless Brush Co.: *See—*
Hunt, Frederick B., 4,276,674, Cl. 15-182.000.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Digital frequency-phase comparator. 4,277,754, Cl. 328-133.000.
Minato, Mitsuaki: *See—*
Nakayama, Muneo; Nishimura, Toshihiro; Nakane, Hisashi; Toda, Shozo; Hotta, Yoshio; and Minato, Mitsuaki, 4,277,525, Cl. 427-387.000.
Minegishi, Yutaka; and Nishimura, Toshiro, to Kao Soap Co., Ltd. Textile softening agent. 4,277,350, Cl. 252-8.800.
Ministry of International Trade & Industry: *See—*
Tateishi, Tetsuya, 4,277,828, Cl. 364-415.000.
Minnesota Mining and Manufacturing Company: *See—*
Hoekman, Earl B., 4,277,693, Cl. 307-141.000.
Sonnonstine, Terry J.; and Kneipp, Kenneth G., 4,277,551, Cl. 430-120.000.
Minolta Camera Kabushiki Kaisha: *See—*
Konoma, Kunihiko, 4,277,149, Cl. 350-467.000.
Tabuchi, Kenji; and Iwata, Hidehito, 4,277,003, Cl. 222-350.000.
Wada, Kenichi; Murasaki, Hiroshi; Enoguchi, Yuji; and Fujiwara, Takao, 4,277,165, Cl. 355-55.000.
Miquel, Jean: *See—*
Courty, Philippe; Miquel, Jean; Martino, Germain; and Convers, Alain, 4,277,369, Cl. 252-415.000.
Mis, Frank J., to Harris Hub Co., Inc. Bed frame of adjustable width. 4,276,665, Cl. 5-184.000.
Mishiro, Shoji, to Taga Electric Company, Limited. Ultrasonic wave generating apparatus with voltage-controlled filter. 4,277,758, Cl. 331-1.00R.
Mislan, Joseph D. Method for pressure casting metal objects. 4,276,923, Cl. 164-76.000.
Mitchell, Glen R.: *See—*
Collins, Robert W.; Hoffman, Roy L.; Loen, Larry W.; Mitchell, Glen R.; and Soltis, Frank G., 4,277,826, Cl. 364-200.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Tanaka, Toshio; Namizaki, Hirofumi; Takamiya, Saburo; and Susaki, Wataru, 4,277,759, Cl. 331-94.50H.
Mitsubishi Paper Mills, Ltd.: *See—*
Nakajima, Hideiku; Koyama, Itsuji; Kusama, You; and Ashie, Yutaka, 4,277,524, Cl. 427-362.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,277,589, Cl. 526-122.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Yoshimoto, Takeo; Igarashi, Keiichi; Oda, Kengo; Ura, Masaaki; and Sato, Naoki, 4,277,624, Cl. 568-44.000.
Mitsunaga, Takayoshi; Chinushi, Kiyoto; and Umezu, Tadashi, to Sumitomo Chemical Company, Limited. Water-soluble biotin-containing preparation. 4,277,488, Cl. 424-273.00R.
Miura, Yasuhisa: *See—*
Asada, Touru; Miura, Yasuhisa; and Yoshino, Tsutomu, 4,277,622, Cl. 564-512.000.
Miyade, Eimei: *See—*
Izumitani, Tetsuro; and Miyade, Eimei, 4,277,523, Cl. 427-294.000.
Miyagawa, Fumihiro; and Sawabe, Kousaku, to Ricoh Company, Ltd. Lens tube retraction mechanism for camera having retractable lens tube. 4,277,157, Cl. 354-187.000.
Miyajima, Keiji: *See—*
Sugiura, Takeo; Miyajima, Keiji; Nagatomo, Hideo; and Masui, Kiyoshi, 4,277,514, Cl. 427-1.000.
Miyamoto, Yukihiko: *See—*
Wada, Takeshi; Ienaka, Masanori; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,277,703, Cl. 307-553.000.
Miyazaki, Kenichi: *See—*
Nakagaki, Shintaro; Takanashi, Itsuo; Motoyama, Koichiro; Miyoshi, Tadayoshi; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,277,800, Cl. 358-44.000.

Miyazaki, Yorizo, to Laurel Bank Machine Co., Ltd. Apparatus for guiding wrapping paper in coin wrapping machine. 4,276,735, Cl. 53-212.000.

Miyoshi, Tadayoshi: *See*—
Nakagaki, Shintaro; Takanashi, Itsuo; Motoyama, Koichiro; Miyoshi, Tadayoshi; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,277,800, Cl. 358-44.000.

Mizukura, Noboru: *See*—
Onodera, Kaoru; Mizukura, Noboru; and Kobayashi, Ryuichiro, 4,277,553, Cl. 430-216.000.

MKS Instruments, Inc.: *See*—
Harvey, Philip C., 4,277,747, Cl. 324-78.00D.

Moba Holding Barneveld B.V.: *See*—
van Kattenbroek, Hendrik J., 4,276,977, Cl. 198-446.000.

Mobil Tyco Solar Energy Corporation: *See*—
Sachs, Emanual M., 4,277,441, Cl. 422-105.000.

Model A and Model T Motor Car Reproduction Corporation, The: *See*—
Turner, Nelson R.; Sanders, Daniel E.; and Bienenstein, Charles A., 4,277,087, Cl. 280-718.000.

Modler, Peter R.; Dittmer, Harold E.; Rose, Richard L.; and Stafsnes, John A., to Pax Equipment Management, Inc. Refrigerated air cargo container. 4,276,752, Cl. 62-166.000.

Modrovich, Ivan E. Stabilized liquid enzyme and coenzyme compositions. 4,277,562, Cl. 435-17.000.

Moertel, George B., to Textron, Inc. Slide fastener. 4,276,679, Cl. 24-205.16R.

Moertel, George B., to Textron, Inc. Low cost slide fastener stringer. 4,276,680, Cl. 24-205.16R.

Mogul Corporation: *See*—
Lipinski, Richard J., 4,277,359, Cl. 252-181.000.

Molins Limited: *See*—
Dyett, Derek H.; and Rakowicz, Jan A., 4,276,891, Cl. 131-84.00C.

Molloy, Bryan B.; and Steinberg, Mitchell I., to Eli Lilly and Company. Para-nitrophenylalkylamines and pharmaceutical compositions. 4,277,501, Cl. 424-330.000.

Monget, Daniel; and Nardon, Paul, to Laboratoire de Recherche API. Support for the determination of enzyme activities and process. 4,277,561, Cl. 435-14.000.

Monsanto Company: *See*—
Aliberti, Vincent A., 4,277,541, Cl. 428-518.000.
Hoagland, John C., 4,277,338, Cl. 210-186.000.
Jastrzebski, Michael B.; and Padwa, Allen R., 4,277,574, Cl. 525-86.000.
Koenig, Karl E., 4,277,420, Cl. 560-24.000.

Monte, Salvatore J.: *See*—
Sugerman, Gerald; and Monte, Salvatore J., 4,277,415, Cl. 260-429.500.

Montedison S.p.A.: *See*—
Caldo, Cornelio; and Basili, Luigi, 4,277,371, Cl. 252-429.00B.
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,277,589, Cl. 526-122.000.

Montesi, Edward M., to Norton Company. Accessory to hard hat attaching means. 4,276,657, Cl. 2-422.000.

Montgrain, Luc, to Alcan Research and Development Limited. Apparatus and method for removal of alkali and alkaline earth metals from molten aluminium. 4,277,280, Cl. 75-68.00R.

Moodie, Stanley T.: *See*—
Bargeron, Thomas C.; and Moodie, Stanley T., 4,277,045, Cl. 248-599.000.

Moore Business Forms: *See*—
Wakeman, William R.; Van Malderghem, Edmund G.; and Greulich, Kenneth R., 4,277,016, Cl. 229-69.000.

Moore, James H.: *See*—
Ore, Fernando; Ellis, John D.; and Moore, James H., 4,277,448, Cl. 423-167.000.

Moore, Kenneth L.: *See*—
Reed, Russell, Jr.; Moore, Kenneth L.; and Meyers, Gary W., 4,277,203, Cl. 405-264.000.

Moore, Kenneth M.: *See*—
Bauer, Claude J.; and Moore, Kenneth M., 4,277,641, Cl. 174-65.00R.

Morel, Claude: *See*—
DuPont, Regis; Lardenois, Patrick; Morel, Claude; Frost, Jonathan; and Koletar, Gabor I., 4,277,476, Cl. 424-250.000.

Morel, Henri, to ITW de France. Self-retained and reusable fastener. 4,276,806, Cl. 411-41.000.

Morel, Henri, to ITW de France. Fixing device for securing any part to a holding member such as a panel by inserting said fixing device into a hole of standard shape formed in said panel. 4,277,196, Cl. 403-3.000.

Morewood, William H., to Winsford Products, Inc. Self-feeding device for handicapped persons. 4,277,213, Cl. 414-9.000.

Morgan, Gary B.: *See*—
Thomas, Robert J.; Piekarski, Michael; Morgan, Gary B.; Rank, John; Thurman, William O.; and Lerch, Donald C., 4,277,689, Cl. 250-567.000.

Morgan, Robert L.; Cupitt, Larry T.; and Gamble, William L., to United States of America, Army. Visible and infrared intensity limiter. 4,277,146, Cl. 350-356.000.

Mori, Keiichi: *See*—
Kikuchi, Shoji; Yajima, Toshio; Kishi, Kenichi; Sasaki, Takashi; Mori, Keiichi; and Sato, Haruhiko, 4,277,558, Cl. 430-542.000.

Mori, Shun'ichiro; Kimata, Kunio; Aoygi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, to Matsushita Electric Industrial Co., Ltd. Temperature control system for electric heating apparatus. 4,277,670, Cl. 219-492.000.

Mori, Shunichiro; Kimata, Kunio; Aoyagi, Hirofumi; Horii, Hiroshi; and Hasegawa, Hidenobu, to Matsushita Electric Industrial Co., Ltd. Temperature control system for electric heating appliance. 4,277,671, Cl. 219-494.000.

Morinaga, Shigeki: *See*—
Tokuda, Hiroastu; Morinaga, Shigeki; and Nakamura, Hideo, 4,277,829, Cl. 364-431.000.

Morlin, Andras: *See*—
Makara, Gyorgy; Morlin, Andras; Fozo, Andras; and Fulop, Robert, 4,276,818, Cl. 98-40.00B.

Morrison, Clifton H.: *See*—
Rasmussen, Glenn; Huston, Larry; Morse, Donald W.; Tsuchiya, Takuzo; Morrison, Clifton H.; Rustad, Stanley C.; and Eiden, Leo, 4,276,795, Cl. 83-42.000.

Morse, Donald W.: *See*—
Rasmussen, Glenn; Huston, Larry; Morse, Donald W.; Tsuchiya, Takuzo; Morrison, Clifton H.; Rustad, Stanley C.; and Eiden, Leo, 4,276,795, Cl. 83-42.000.

Mostert, Jacob J. Method of jacking up a vehicle, and jack therefor. 4,277,050, Cl. 254-94.000.

Motonami, Masanao: *See*—
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,277,088, Cl. 280-804.000.

Motorola, Inc.: *See*—
Alberkrack, Jade H., 4,277,824, Cl. 363-49.000.
Capurka, Zbynek A., 4,276,860, Cl. 123-415.000.
Vasquez, Ray M., 4,277,698, Cl. 307-272.00A.

Motoyama, Koichiro: *See*—
Nakagaki, Shintaro; Takanashi, Itsuo; Motoyama, Koichiro; Miyoshi, Tadayoshi; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,277,800, Cl. 358-44.000.

Moumaneix, Francis; and Marietta, Cesar, to Anciens Etablissements Leon Guilbert & Fils. Dual gas supply blow torch. 4,277,031, Cl. 239-414.000.

Mowery, Kenneth D.: *See*—
Kearney, Mark B.; Mowery, Kenneth D.; and Pechous, L. Joseph, 4,276,861, Cl. 123-425.000.

Mucciardi, Frank: *See*—
Guthrie, Roderick I. L.; and Mucciardi, Frank, 4,277,282, Cl. 75-53.000.

Muehling, Anthony A., to Black & Decker Inc. Power tool apparatus. 4,276,799, Cl. 83-473.000.

Mueller, Herbert; Paulus, Gerhard; Schoeppl, Hubert; and Scharf, Emil, to BASF Aktiengesellschaft. Vulcanization activator. 4,277,422, Cl. 260-791.000.

Mueller, Karl F.; and Good, William R., to Ciba-Geigy Corporation. Water-insoluble hydrophilic copolymers. 4,277,582, Cl. 525-421.000.

Mukaida, Yutaka: *See*—
Enomoto, Satoru; Wada, Hisayuki; Nishita, Sadao; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,277,633, Cl. 568-879.000.

Muller, Karl-Heinz, to Robert Bosch GmbH. Gear machine operable as pump or motor with axially spaced and circumferentially offset pair of gears. 4,277,230, Cl. 418-131.000.

Muller, Klaus; Maurer, Helmut; Linder, Ernst; Rieger, Franz; and Ziegler, Bodo, to Robert Bosch GmbH. Electrochemical oxygen sensor, particularly for use in the exhaust system of automotive-type internal combustion engines. 4,277,323, Cl. 204-195.00S.

Muller, Norbert: *See*—
Delp, Hermann; and Muller, Norbert, 4,277,658, Cl. 200-61.540.

Muller, Werner H.: *See*—
Meidert, Helmut; Pressler, Wilfried; and Muller, Werner H., 4,277,606, Cl. 546-157.000.

Muller-Werth, Bernd. Method of and means for utilizing rechargeable batteries in the operation of electric vehicles. 4,277,737, Cl. 320-2.000.

Muller, Wolfgang: *See*—
Johne, Hans; Jentzsch, Arndt; Schmidt, Lothar; Muller, Wolfgang; and Funke, Mandred, 4,276,827, Cl. 101-212.000.

Munderich, Paul. Method and apparatus for making bituminous mixtures. 4,277,180, Cl. 366-7.000.

Munson, William A., to Westinghouse Electric Corp. Slip recovery system for wound rotor motor. 4,277,733, Cl. 318-732.000.

Murasaki, Hiroshi: *See*—
Wada, Kenichi; Murasaki, Hiroshi; Enoguchi, Yuji; and Fujiwara, Takao, 4,277,165, Cl. 355-55.000.

Murray, John T., to United Centrifugal Pumps. Adjustable angle star feed machining slide. 4,277,210, Cl. 409-191.000.

Murray, William K., to Tri-State Oil Tool Industries, Inc. Junk basket. 4,276,931, Cl. 166-99.000.

Mutsaers, Cornelis A. H. A.: *See*—
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., 4,277,542, Cl. 338-308.000.

MWA Company: *See*—
King, John L., Jr., 4,276,724, Cl. 51-266.000.

Naarmann, Herbert; Penzien, Klaus; Doerfel, Helmut; and Eckell, Albrecht, to BASF Aktiengesellschaft. Preparation of acetylene copolymers. 4,277,588, Cl. 526-114.000.

Nabisco, Inc.: *See*—
Koppa, Daniel A.; and Aquino, Agostino J., 4,276,800, Cl. 83-863.000.

Naegeli, Peter: *See*—
Helmlinger, Daniel; and Naegeli, Peter, 4,277,618, Cl. 560-231.000.

Naegeli, Walter: *See*—
Sterki, Armin; Sommer, Gerd R.; and Naegeli, Walter, 4,276,699, Cl. 33-179.50R.

Nagahara, Shusaku: *See*—
Koike, Norio; Takemoto, Iwao; Kubo, Masaharu; Sato, Kazuhiro; and Nagahara, Shusaku, 4,277,799, Cl. 358-44.000.

Nagaki, Takehiro, to Sony Corporation. Magnetic transducer head. 4,277,808, Cl. 360-113.000.

Nagami, Koichi: *See*—
Hayashi, Masaaki; Nagami, Koichi; Tsuneta, Kazuyoshi; and Kenmotusu, Nobuhiro, 4,277,383, Cl. 260-29.300.

Nagase, Hiroshi: *See*—
Okuyama, Toshiaki; Kubota, Yuzuru; and Nagase, Hiroshi, 4,277,735, Cl. 318-766.000.

Nagatomo, Hideo: *See*—
Sugiura, Takeo; Miyajima, Keiji; Nagatomo, Hideo; and Masui, Kiyoshi, 4,277,514, Cl. 427-1.000.

Nagel, Erich; Turcke, Rainer; and Ludemann, Heinz, to AGFA-Gevaert, A.G. Apparatus for classifying photographic prints or the like. 4,277,061, Cl. 271-302.000.

Nakagaki, Shintaro; Takanashi, Itsuo; Motoyama, Koichiro; Miyoshi, Tadayoshi; Yokokawa, Sumio; and Miyazaki, Kenichi, to Victor Company of Japan, Ltd. Color television signal generating apparatus. 4,277,800, Cl. 358-44.000.

Nakagawa, Kazuyuki: *See*—
Nishi, Takao; and Nakagawa, Kazuyuki, 4,277,479, Cl. 424-258.000.

Nakai, Toshio; Kuzuya, Susumu; Onoda, Hiroshi; Iwase, Takayuki; and Asai, Akira, to Brother Industires, Ltd. End of line locking mechanism for power operated typewriter. 4,277,192, Cl. 400-671.000.

Nakajima, Hideiku; Koyama, Itsuji; Kusama, You; and Ashie, Yutaka, to Mitsubishi Paper Mills, Ltd. Method and apparatus for finishing coated papers. 4,277,524, Cl. 427-362.000.

Nakajima, Tokuyoshi: *See*—
Kawamura, Hiromitsu; Nakajima, Tokuyoshi; and Shibuya, Yoshimichi, 4,277,275, Cl. 65-43.000.

Nakamura, Hideo: *See*—
Tokuda, Hiroastu; Morinaga, Shigeki; and Nakamura, Hideo, 4,277,829, Cl. 364-431.000.

Nakamura, Isao: *See*—
Ikesue, Masumi; Yano, Takashi; Tatsumi, Susumu; Idenawa, Hiroyuki; Nakamura, Isao; and Tani, Tatsuo, 4,277,163, Cl. 355-14.00R.

Nakamura, Ken: *See*—
Fujita, Hisao; Tanaka, Yasuhiko; Kobayashi, Isao; and Nakamura, Ken, 4,276,854, Cl. 118-689.000.

Nakane, Hisashi: *See*—
Nakayama, Muneo; Nishimura, Toshihiro; Nakane, Hisashi; Toda, Shozo; Hotta, Yoshio; and Minato, Mitsuaki, 4,277,525, Cl. 427-387.000.

Nakao, Toshihiro: *See*—
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,277,674, Cl. 235-92.0EA.

Nakata, Koreaki; Oita, Masahiro; and Hirohata, Hyogo, to Matsushita Electric Industrial Co., Ltd. Anode for solid electrolytic capacitor and method for making the same. 4,277,543, Cl. 428-546.000.

Nakayama, Muneo; Nishimura, Toshihiro; Nakane, Hisashi; Toda, Shozo; Hotta, Yoshio; and Minato, Mitsuaki, to Tokyo Ohka Kogyo Kabushiki Kaisha; and Tokyo Denshi Kagaku Kabushiki Kaisha. Liquid compositions for forming silica coating films. 4,277,525, Cl. 427-387.000.

Nakazawa, Nobuhiko: *See*—
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,277,460, Cl. 424-1.000.
Sakakibara, Shumpei; Kumahara, Yuichi; Okada, Yoshiaki; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tsushima, Shoichiro, 4,277,393, Cl. 260-112.50R.

Nakland, Rikard: *See*—
Aaras, Arne; Martinsen, Kjell M.; and Nakland, Rikard, 4,277,102, Cl. 297-411.000.

Nally, Robert B.; Akister, James F.; and Trohatos, George, to NCR Canada LTD - NCR Canada Ltee. Character recognition system. 4,277,775, Cl. 340-146.30Q.

Nally, Robert B.; Akister, James F.; and Hulford, David, to NCR Canada Ltd - NCR Canada Ltee. Magnetic ink character recognition apparatus. 4,277,776, Cl. 340-146.3AG.

Namizaki, Hirofumi: *See*—
Tanaka, Toshio; Namizaki, Hirofumi; Takamiya, Saburo; and Susaki, Wataru, 4,277,759, Cl. 331-94.50H.

Nardon, Paul: *See*—
Monget, Daniel; and Nardon, Paul, 4,277,561, Cl. 435-14.000.

Narita, Masao: *See*—
Matsuura, Ryo; Matsuzaki, Katsumi; and Narita, Masao, 4,277,257, Cl. 55-85.000.

Naruse, Kazumichi: *See*—
Takada, Shigetaka; Naruse, Kazumichi; and Watanabe, Yukihiro, 4,276,745, Cl. 60-276.000.

National Semiconductor Corporation: *See*—
Priel, Ury, 4,277,739, Cl. 323-313.000.

Nayar, Raman: *See*—
Lucas, John M.; and Nayar, Raman, 4,276,766, Cl. 73-1.00R.

Naylor, Floyd E., to Phillips Petroleum Company. Process for producing random copolymers of conjugated dienes and alpha-methylstyrene type monomers. 4,277,591, Cl. 526-174.000.

NCR Canada LTD - NCR Canada Ltee: *See*—
Nally, Robert B.; Akister, James F.; and Trohatos, George, 4,277,775, Cl. 340-146.30Q.
Nally, Robert B.; Akister, James F.; and Hulford, David, 4,277,776, Cl. 340-146.3AG.

Neher, Hans, to J. Hengstler K.G. Mechanical counter. 4,277,677, Cl. 235-109.000.

Neil Brown Instruments Systems, Inc.: *See*—
Lawson, Kenneth D.; and Brown, Neil L., 4,277,751, Cl. 324-254.000.

Nelson, Lorne W., to Honeywell Inc. Clock thermostat apparatus for resetting the temperature of a space during selected time periods with means for varying the pickup time as a function of the drop in space temperature during the setback period. 4,277,018, Cl. 236-46.00R.

Nelson, Richard M., to Guy F. Atkinson Company. Case construction for multi-stage pump. 4,277,223, Cl. 415-199.100.

Nelson, Richard S.; Hudson, John A.; and Mazey, David J. Growth of synthetic diamonds having altered electrical conductivity. 4,277,293, Cl. 148-175.000.

Nelson, Robert W.: *See*—
Hunck, Billie G.; and Nelson, Robert W., 4,276,896, Cl. 137-101.000.

Newage Kitchens Limited: *See*—
Bargiel, Stefan, 4,277,122, Cl. 312-330.00R.

Newman, Thomas M., to Compu-Pic Incorporated. Lottery number generating method and apparatus. 4,277,064, Cl. 273-138.00A.

Newman, Timothy L. Truck mounted railroad crane. 4,276,985, Cl. 212-177.000.

Neyrpic: *See*—
Lourdeaux, Bernard, 4,276,905, Cl. 137-613.000.

Nichols, Donald H. Microwave oven cooking time scale. 4,276,948, Cl. 177-44.000.

Nichols Institute: *See*—
Broughton, Alan, 4,277,249, Cl. 23-230.00B.

Nichols, Richard D. E.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,277,007, Cl. 224-193.000.

Nielsen, James W., to Nielsen, Sharon G. Device for killing moss. 4,276,732, Cl. 52-517.000.

Nielsen, Sharon G.: *See*—
Nielsen, James W., 4,276,732, Cl. 52-517.000.

Nink, Horst: *See*—
Keller, Hartmut; Krauth, Axel; Maier, Horst R.; Nink, Horst; Pohlmann, Hans J.; Reddig, Horst; and Siebels, Johann, 4,277,539, Cl. 428-450.000.

Nippon Electric Co., Ltd.: *See*—
Kawakami, Yuichi, 4,277,836, Cl. 364-900.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kaneko, Yasutoski, 4,276,805, Cl. 84-458.000.

Nippon Hoso Kyokai: *See*—
Nonaka, Yasuhiko; Goto, Naohiro; and Shidara, Keiichi, 4,277,515, Cl. 427-76.000.

Nippon Light Metal Company Limited: *See*—
Shiga, Yoshinobu; Kage, Ryusuke; and Iwata, Masakatsu, 4,276,729, Cl. 52-209.000.

Nippon Shokubai Kaguku Kogyo Co., Ltd.: *See*—
Kumazawa, Toshihiko; Yamamoto, Takeshi; and Odanaka, Hiroshi, 4,277,632, Cl. 568-867.000.

Nippon Soken, Inc.: *See*—
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,276,773, Cl. 73-204.000.
Yasuda, Eturo; and Ohta, Minoru, 4,277,439, Cl. 422-94.000.

Nippon Zoki Pharmaceutical Co., Ltd.: *See*—
Kohda, Akihide; and Kurosaki, Teikichi, 4,277,474, Cl. 424-248.570.

Nishi, Takao; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Tetrazolylalkoxycarbostyril derivatives and pharmaceutical compositions containing them. 4,277,479, Cl. 424-258.000.

Nishikawa, Masaji; and Amemiya, Norio, to Olympus Optical Company Limited. Photosensitive screen for electrographic apparatus. 4,277,550, Cl. 430-68.000.

Nishimoto, Seiya: *See*—
Fujii, Kiyoshi; Tsuji, Keiji; and Nishimoto, Seiya, 4,277,774, Cl. 340-146.30Q.

Nishimura, Toshihiro: *See*—
Nakayama, Muneo; Nishimura, Toshihiro; Nakane, Hisashi; Toda, Shozo; Hotta, Yoshio; and Minato, Mitsuaki, 4,277,525, Cl. 427-387.000.

Nishimura, Toshiro: *See*—
Minegishi, Yutaka; and Nishimura, Toshiro, 4,277,350, Cl. 252-8.800.

Nishino, Yoshinori: *See*—
Yamamoto, Masahiko; and Nishino, Yoshinori, 4,277,688, Cl. 250-506.000.

Nishita, Sadao: *See*—
Enomoto, Satoru; Wada, Hisayuki; Nishita, Sadao; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,277,633, Cl. 568-879.000.

Nissan Motor Company, Limited: *See*—
Hamai, Kyugo, 4,276,865, Cl. 123-569.000.
Higashiyama, Kazuhiro, 4,276,866, Cl. 123-571.000.
Sugasawa, Fukashi; Iizuka, Haruhiko; and Matsumoto, Junichiro, 4,276,863, Cl. 123-481.000.

Niu, Gregory C.: *See*—
Deichert, William G.; Niu, Gregory C.; and VanBuren, Martin F., 4,277,595, Cl. 528-26.000.

NL Industries, Inc.: *See*—
Saliger, Kenneth C.; and Jansen, Martin B., 4,276,932, Cl. 166-214.000.

Noguchi, Kenzo: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.
Noguchi, Kohji: *See*—
Asanae, Masumi; and Noguchi, Kohji, 4,277,552, Cl. 430-122.000.
Noguez, Robert W. Fuel calibration device for carburetor. 4,277,423, Cl. 261-34.00R.
Nolin, Roger J. Two-bolt lockset with simultaneous locking and unlocking of its bolts. 4,276,760, Cl. 70-107.000.
Nomura, Satoshi: *See*—
Doi, Takao; and Nomura, Satoshi, 4,277,528, Cl. 428-192.000.
Nonaka, Yasuhiko; Goto, Naohiro; and Shidara, Keiichi, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Targets for use in photoconductive image pickup tubes. 4,277,515, Cl. 427-76.000.
Noren, Sven A. Plant for utilizing kinetic energy. 4,277,690, Cl. 290-53.000.
Norlin Industries, Inc.: *See*—
Hall, George R.; and Hall, Robert J., 4,277,697, Cl. 307-265.000.
Norris, Alan H.: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,276,740, Cl. 57-205.000.
Northern Telecom Limited: *See*—
Arend, Inez F.; and Locke, James S., 4,277,650, Cl. 179-84.0VF.
Northrup, Lynn L., Jr.: *See*—
Blake, Floyd A.; and Northrup, Lynn L., Jr., 4,276,872, Cl. 126-425.000.
Norton Company: *See*—
Montesi, Edward M., 4,276,657, Cl. 2-422.000.
Norton, Richard V.; Frank, Peter J.; Fisher, Dennis H.; and Howe, Steven C., to Ashland Oil, Inc. Process for preparing high density fuels. 4,277,636, Cl. 585-14.000.
Nott Company: *See*—
Mahle, Howard C.; and Wesenberg, Kenneth L., 4,277,214, Cl. 414-139.000.
Nottke, James E.: *See*—
de Fasselle, Robert J.; Baron, Richard D.; and Nottke, James E., 4,276,734, Cl. 53-77.000.
Nozawa, Takamitsu, to Yoshino Kogyosho Co., Ltd. Invertible miniature atomizer of manual type. 4,277,001, Cl. 222-321.000.
Nu-Tech Industries, Inc.: *See*—
Isaacson, Milton S., 4,277,706, Cl. 310-80.000.
Nukem G.m.b.H.: *See*—
Bregulla, Eduard; Chrubasik, Alfred; and Vietzke, Horst, 4,276,834, Cl. 110-237.000.
Nuzillat, Gerard, to Thomson-CSF. Structure for logic circuits. 4,277,794, Cl. 357-40.000.
Nyi, Kayson; and Graham, Sandra I., to Rohm and Haas Company. Radiation curable compositions. 4,277,319, Cl. 204-159.230.
Obayashi, Hideki: *See*—
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,276,773, Cl. 73-204.000.
Occidental Petroleum Corporation: *See*—
Ore, Fernando; Ellis, John D.; and Moore, James H., 4,277,448, Cl. 423-167.000.
Wahl, Edward F., III; and Boucher, Frederic B., 4,276,748, Cl. 60-641.00D.
Oce-Nederland B.V.: *See*—
van Boven, Petrus L. M.; and Winthaegen, Leon M. W., 4,277,166, Cl. 355-67.000.
Oda, Kengo: *See*—
Yoshimoto, Takeo; Igarashi, Keiichi; Oda, Kengo; Ura, Masaaki; and Sato, Naoki, 4,277,624, Cl. 568-44.000.
Oda, Yoshio; Yamabe, Masaaki; and Kato, Masao, to Asahi Glass Company, Ltd. Macromolecular adsorbent containing pendant difluoroalkyl phosphate groups for adsorbing heavy metal ions. 4,277,565, Cl. 521-31.000.
Odanaka, Hiroshi: *See*—
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Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,277,088, Cl. 280-804.000.
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Kato, Shingi; Ogawa, Nobuo; Kawanami, Norio; and Onda, Takashi, 4,277,426, Cl. 264-8.000.
Ogden, Gerald W., to General Time Corporation. Elapsed time indicator. 4,277,841, Cl. 368-78.000.
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Carlson, George M.; and O'Hagan, Michael, 4,277,827, Cl. 364-200.000.
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Deen, Harold E.; O'Halloran, Rosemary; Winans, Esther D.; Ryer, Jack; and Brois, Stanley J., 4,277,353, Cl. 252-51.50R.
Ohio-Nuclear, Inc.: *See*—
Covic, John; Leininger, Glen; and Carlson, Roland W., 4,277,685, Cl. 250-445.00T.
Ohkawa, Tihiro, to General Atomic Company. Coil-less divertors for toroidal plasma systems. 4,277,306, Cl. 176-9.000.
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Yasuda, Eturo; and Ohta, Minoru, 4,277,439, Cl. 422-94.000.
Oikawa, Teruo: *See*—
Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, 4,277,457, Cl. 423-331.000.
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Okuda, Genzaburo. Hydraulic actuator with automatic travel limit bypass. 4,277,048, Cl. 254-8.00B.
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Chambers, Richard F.; and Rachima, Nissim, 4,277,447, Cl. 423-165.000.
Oliver, Richard J.: *See*—
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Bubley, Henry J.; and Oltra, Claude H., 4,276,826, Cl. 101-123.000.
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Fortmann, Hermann, 4,277,164, Cl. 355-16.000.
Olympus Optical Company Limited: *See*—
Nishikawa, Masaji; and Amemiya, Norio, 4,277,550, Cl. 430-68.000.
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,277,674, Cl. 235-92.0EA.
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Oppolzer, Wolfgang, to Givaudan Corporation. Process for making norpatchoulenol. 4,277,631, Cl. 568-817.000.
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Seddon, Richard I., 4,276,855, Cl. 118-719.000.
Orazio, Fred D., Jr.: *See*—
Silva, Robert M.; and Orazio, Fred D., Jr., 4,277,761, Cl. 331-94.50T.
Orcutt, Dee R., to PPG Industries, Inc. Method of fabricating window panels, particularly curved panels. 4,277,294, Cl. 156-102.000.
Ore, Fernando; Ellis, John D.; and Moore, James H., to Occidental Petroleum Corporation. Phosphoric acid process with high circulation rates. 4,277,448, Cl. 423-167.000.
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Hajos, Zoltan G.; and Levine, Seymour, 4,277,401, Cl. 260-340.600.
Osadca, Modest, to Hoffmann-La Roche Inc. Methods for the detection of low level concentrations of sulfonamides. 4,277,248, Cl. 23-230.00M.
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Osbourne, Barry C. Device for holding bed clothes in position. 4,276,667, Cl. 5-498.000.
Ostand, Paul R., to Dover Corporation. Sensing arrangements for sensing the presence of liquid in a vapor line. 4,276,916, Cl. 141-206.0uu.
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Otis Engineering Corporation: *See*—
Calhoun, Michael B.; Bayh, Russell I., III; and Dutton, Robert E., 4,276,937, Cl. 166-323.000.

Otsuka Pharmaceutical Co., Ltd.: *See*—
Nishi, Takao; and Nakagawa, Kazuyuki, 4,277,479, Cl. 424-258.000.
Oulman, Charles S.; and Chriswell, Colin D., to Iowa State University Research Foundation, Inc. Process of concentrating ethanol from dilute aqueous solutions thereof. 4,277,635, Cl. 568-916.000.
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Burrows, Thomas W.; and Cavil, David T., 4,276,868, Cl. 123-602.000.
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Chrisman, Max G., 4,277,274, Cl. 65-29.000.
Lin, Kingso C.; and Hammond, Donald J., 4,277,382, Cl. 260-29.20M.
Propster, Mark A., 4,277,277, Cl. 65-134.000.
Shah, Hashmuk G.; and Machlan, G. Richard, 4,277,436, Cl. 264-518.000.
Swanson, Michael E.; and Lauderback, Sanford K., 4,277,386, Cl. 260-29.6RW.
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Spanoudis, Louis, 4,277,013, Cl. 228-136.000.
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Penzotti, Roger P.; and Schmeisser, Gordon F., 4,276,953, Cl. 180-328.000.
Pacer Systems, Inc.: *See*—
Horwitz, Joshua, 4,276,702, Cl. 434-47.000.
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Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, 4,277,516, Cl. 427-81.000.
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Paciorek, Leonard J.: *See*—
Gerst, Carl W.; and Paciorek, Leonard J., 4,277,748, Cl. 324-83.00D.
Padwa, Allen R.: *See*—
Jastrzebski, Michael B.; and Padwa, Allen R., 4,277,574, Cl. 525-86.000.
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Palmieri, Vincent A.; and Palmieri, John P., 4,276,691, Cl. 30-347.000.
Palmieri, Joseph M., to Fuel Computer Corporation of America. Electronic temperature control system. 4,276,925, Cl. 165-12.000.
Palmieri, Vincent A.; and Palmieri, John P. Rotary nylon line vegetation cutter. 4,276,691, Cl. 30-347.000.
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Hanson, Donald W.; and Palmquist, William E., 4,276,658, Cl. 3-1.500.
Pan, Jing-Jong: *See*—
Rosier, Charles D.; Pan, Jing-Jong; and Belcher, Donald K., 4,277,764, Cl. 333-24.00C.
Panametrics, Inc.: *See*—
Kovac, Michael G.; Chleck, David J.; and Goodman, Philip, 4,277,742, Cl. 324-61.00R.
Pantaleon-Stemberg, Gerd: *See*—
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Paolasini, Sergio, to Centro Ricerche Fiat S.p.A. Process for the manufacture of a monolithic support for catalysts suitable for use in controlling carbon monoxide emissions. 4,277,376, Cl. 252-455.00R.
Parkins, David W.: *See*—
Dinsdale, Jack; Parkins, David W.; and Hardwick, John P., 4,277,070, Cl. 369-248.000.
Parks, Kenneth B., to Bell Telephone Laboratories, Incorporated. Cable tester for multipair cables. 4,277,740, Cl. 324-51.000.
Parmee, Keith: *See*—
Burnett, Stanley F.; Dunkley, Michael; Grimes, Raymond M.; and Parmee, Keith, 4,276,972, Cl. 192-4.00C.
Parodi, Sandro: *See*—
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,277,589, Cl. 526-122.000.
Partek Corporation of Houston: *See*—
Pacht, Amos, 4,277,229, Cl. 417-454.000.
Passamenti, Anthony: *See*—
Zbriger, Michael J.; and Passamenti, Anthony, 4,276,717, Cl. 46-262.000.
Passarotti, Carlo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,277,491, Cl. 424-285.000.
Pastora Alice, Julio C. Cartridge case. 4,276,830, Cl. 102-467.000.
Pataick, Vicky England: *See*—
Pinckard, William A., 4,277,006, Cl. 294-145.000.
Patel, Babubhai C.: *See*—
Hermann, Gerson; Patel, Babubhai C.; and Patel, Sudhakerbhai B., 4,277,379, Cl. 252-608.000.
Patel, Chandra K. N.; and Tam, Andrew C., to Bell Telephone Laboratories, Incorporated. Optoacoustic spectroscopy of thin layers. 4,276,780, Cl. 73-643.000.
Patel, Sudhakerbhai B.: *See*—
Hermann, Gerson; Patel, Babubhai C.; and Patel, Sudhakerbhai B., 4,277,379, Cl. 252-608.000.
Pathology Products, Ltd.: *See*—
Goldman, Max; and Stein, Arthur A., 4,276,819, Cl. 98-115.0LH.
Pauli, Arthur G.; Schade, Reinhart; and Stiel, Karl, to Siemens Aktiengesellschaft. Liquid crystal cell having electrodes on adjacent plates connected by a contact bridge and the process of producing same. 4,277,143, Cl. 350-334.000.
Paull, Peter L.; and Child, Edward T., to Texaco Development Corporation. Production of reducing gas. 4,277,365, Cl. 252-373.000.
Paulus, Gerhard: *See*—
Mueller, Herbert; Paulus, Gerhard; Schoeppl, Hubert; and Scharf, Emil, 4,277,422, Cl. 260-791.000.
Pavan, Charles; and Bulidon, Jacques, to Roussel Uclaf. Novel purification process. 4,277,408, Cl. 260-397.100.
Pavan, Charles: *See*—
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Pawelzick, George K. Speaker adapter. 4,277,653, Cl. 179-146.00E.
Pax Equipment Management, Inc.: *See*—
Modler, Peter R.; Dittmer, Harold E.; Rose, Richard L.; and Stafsnes, John A., 4,276,752, Cl. 62-166.000.
Paz, Jacob D. Method for continuously monitoring and controlling alkalinity for environmental purposes using a pCO_2 probe. 4,277,343, Cl. 210-614.000.
Pechous, L. Joseph: *See*—
Kearney, Mark B.; Mowery, Kenneth D.; and Pechous, L. Joseph, 4,276,861, Cl. 123-425.000.
Peck & Hale, Inc.: *See*—
Rosaia, Albert H., 4,277,212, Cl. 410-78.000.
Peckinpaugh, Frank L.; and Biron, Raymond J., to Allied Chemical Corporation. Quench process for synthetic fibers using fog and flowing air. 4,277,430, Cl. 264-129.000.
Peet, Norton P.: *See*—
Daniel, John K.; and Peet, Norton P., 4,277,492, Cl. 424-304.000.
Pejchal, Karel; Fritzon, Hans G.; and Lindstrom, Raimo, to Aktiebolaget IRO. Weft thread control device for a weaving loom with removal of the weft thread from a supply spool beside the loom. 4,276,912, Cl. 139-437.000.
Peller, William N., to H-C Industries, Inc. Method of dispensing metered charges of material. 4,277,431, Cl. 264-148.000.
Penning, Cornelis, to U.S. Philips Corporation. Stethoscopic headphone set. 4,277,654, Cl. 179-156.00R.
Pentel Kabushkik Kaisha: *See*—
Takahashi, Hiromichi, 4,277,186, Cl. 400-120.000.
Penzien, Klaus: *See*—
Naarmann, Herbert; Penzien, Klaus; Doerfel, Helmut; and Eckell, Albrecht, 4,277,588, Cl. 526-114.000.
Penzotti, Roger P.; and Schmeisser, Gordon F., to Paccar Inc. Shift linkage for a tilt cab truck. 4,276,953, Cl. 180-328.000.
Pereman, Gordon F.: *See*—
Kellar, John D.; and Pereman, Gordon F., 4,277,276, Cl. 65-106.000.
Perez, Arthur; and Abraham, Fayez F., to Tyler Refrigeration Corporation. Gas defrost system including heat exchange. 4,276,755, Cl. 62-196.00B.
Perfect Filter Corporation: *See*—
Posner, Howard L., 4,277,267, Cl. 55-494.000.
Perobelli, Aldo; and Pessina, Giorgio, to Messrs. O.M.G. Officina macchine Grafiche de pessina e Perobelli. Method of forming a packet of signatures and stacker for implementing said method. 4,277,060, Cl. 271-186.000.
Perrone, Albert L., deceased; and Perrone, Mary, administratrix, to Perrone, Mary, administratrix, Estate of Albert Perrone. Support device for strengthening the hand gripping of racquet handles and other shaft members. 4,277,063, Cl. 273-75.000.
Perrone, Mary: *See*—
Perrone, Albert L., deceased; and Perrone, Mary, administratrix, 4,277,063, Cl. 273-75.000.
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Persson, Paul M. Information transmitting system. 4,277,778, Cl. 340-171.00A.
Perucchi, Norberto: *See*—
Giger, Urs; and Perucchi, Norberto, 4,277,704, Cl. 310-49.00R.
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Perobelli, Aldo; and Pessina, Giorgio, 4,277,060, Cl. 271-186.000.
Pestrikov, Vladimir I.: *See*—
Salomatin, Viktor M.; Belyanin, Petr N.; and Pestrikov, Vladimir I., 4,276,727, Cl. 52-115.000.
Peter, Gerhard, to Gerhard Peter KG. Apparatus for opening, conveying and dividing tubular coverings. 4,276,815, Cl. 493-287.000.
Peters, Cornelis: *See*—
Hasker, Jan; Vervest, Johannes C. G.; Peters, Cornelis; and Vroomen, Laurentius C. J., 4,277,713, Cl. 313-203.000.
Petrichenko, Vladimir F.: *See*—
Koshman, Vitaly I.; Petrichenko, Vladimir F.; and Kamshitsky, Pavel V., 4,277,766, Cl. 335-122.000.
Petrushka, Robert G.: *See*—
Kerlin, Richard G.; Kossler, Henry T.; Koros, Peter J.; and Petrushka, Robert G., 4,277,279, Cl. 75-58.000.
Pfaff Industriemaschinen GmbH: *See*—
Bolldorf, Kurt, 4,276,838, Cl. 112-221.000.
Pfalzer, Lothar; and Fischer, Siegbert, to J.M. Voith GmbH. Flotation apparatus for separating impurities from a fiber suspension. 4,277,328, Cl. 209-169.000.
Pfarrwaller, Erwin, to Sulzer Brothers Limited. Take-off apparatus for the fabric web of a textile machine, especially a loom. 4,276,911, Cl. 139-308.000.
Pfeifer, Josef: *See*—
Reinehr, Dieter; and Pfeifer, Josef, 4,277,621, Cl. 564-250.000.

Pfizer Inc.: *See—*
Bindra, Jasjit S., 4,277,403, Cl. 260-343.30P.
Welch, Willard M., Jr., 4,277,404, Cl. 260-347.800.

Phillips, Clifton W.: *See—*
Cushing, Charles J.; Phillips, Clifton W.; and VanderNeut, Richard D., 4,277,178, Cl. 356-431.000.

Phillips Petroleum Company: *See—*
Broerman, Arthur B., 4,276,907, Cl. 137-637.200.
Crowley, Ralph P., 4,276,749, Cl. 62-51.000.
Hessert, James E.; and Johnston, Chester C., Jr., 4,276,935, Cl. 166-295.000.
Kubicek, Donald H., 4,277,623, Cl. 568-26.000.
McDaniel, Max P.; and Welch, Melvin B., 4,277,587, Cl. 526-106.000.
Naylor, Floyd E., 4,277,591, Cl. 526-174.000.

Pichler, Ludwig: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, 4,277,487, Cl. 424-273.00R.

Pickel, Hajo, to ITT Industries, Inc. Floating caliper spot type disc brake. 4,276,965, Cl. 188-73.500.

Picone, Charles E., to PPG Industries, Inc. High strength fiber glass reinforced thermoplastic sheets and method of manufacturing same involving a reverse barb needling procedure. 4,277,531, Cl. 428-228.000.

Piekarski, Michael: *See—*
Thomas, Robert J.; Piekarski, Michael; Morgan, Gary B.; Rank, John; Thurman, William O.; and Lerch, Donald C., 4,277,689, Cl. 250-567.000.

Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Method for making flotable, particles suspended in a liquid by means of gas bubbles. 4,277,347, Cl. 210-704.000.

Pielkenrood-Vinitex B.V.: *See—*
Pielkenrood, Jacob, 4,277,347, Cl. 210-704.000.

Pietrocini, Thomas W., to IPM Corporation. Powder metallurgical articles and method of bonding the articles to ferrous base materials. 4,277,544, Cl. 428-547.000.

Pileco, Inc.: *See—*
Kammerer, Otto W., 4,277,676, Cl. 235-92.0PD.

Pinckard, William A., to Pataick, Vicky England, a part interest. Roller skate carrier. 4,277,006, Cl. 294-145.000.

Pioch, Peter P., to Black & Decker Inc. Auxiliary handle for a power tool. 4,276,675, Cl. 16-111.00R.

Piper, George F.; Vesperman, William C.; and Wilson, Max K., to Western Electric Company, Inc. Cordage having a plurality of conductors in a partitioned jacket. 4,277,642, Cl. 174-117.00F.

Pirz, Frank C.: *See—*
Levinson, Stephen E.; and Pirz, Frank C., 4,277,644, Cl. 179-1.0SD.

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Garziera, Gastone; and Pisani, Federico, 4,277,835, Cl. 364-900.000.

Pisano, Alan D., to General Electric Company. Control system for gas turbine engine. 4,276,744, Cl. 60-39.16R.

Piske, Wolfgang, to Trutzschler GmbH & Co. KG. Traveling cover. 4,276,677, Cl. 19-102.000.

Pitney Bowes Deutschland GmbH: *See—*
Schottle, Helmut A. M., 4,276,824, Cl. 101-18.000.

Pitney Bowes, Inc.: *See—*
Calabrese, Richard A., 4,277,161, Cl. 355-3.0FU.

Plastics Engineering Company: *See—*
Waitkus, Phillip A.; and Lepeska, Bohumir, 4,277,583, Cl. 525-423.000.

Platonov, Vladimir N.: *See—*
Kozhevnikov, Vladislav A.; Kononov, Ivan V.; Maslennikov, Ivan E.; Platonov, Vladimir N.; Kharitonovich, Mikhail V.; Ustinov, deceased Viktor I.; and Ustinov, Klavdia G., administrator, 4,276,764, Cl. 72-275.000.

Plessey Handel und Investments AG: *See—*
Harvey, Dennis, 4,277,025, Cl. 239-102.000.
Martin, Barrie J., 4,276,857, Cl. 122-448.00R.

Plum, Willi: *See—*
Mallek, Heinz; Jablonski, Werner; and Plum, Willi, 4,277,362, Cl. 252-301.10W.

Podszun, Wolfgang; Suling, Carlhans; Walkowiak, Michael; and Schulz, Hans H., to Bayer Aktiengesellschaft. Bead polymers of viscous dimethacrylates. 4,277,536, Cl. 428-402.000.

Pohlmann, Hans J.: *See—*
Keller, Hartmut; Krauth, Axel; Maier, Horst R.; Nink, Horst; Pohlmann, Hans J.; Reddig, Horst; and Siebels, Johann, 4,277,539, Cl. 428-450.000.

Polaroid Corporation: *See—*
Foley, James W., 4,277,406, Cl. 260-389.000.
Foley, James W., 4,277,407, Cl. 260-390.000.

Polyair Maschinenbau G.m.b.H.: *See—*
Schmidt, Oskar; and Kubica, Wladyslaw, 4,277,295, Cl. 156-117.000.

Polylok Corporation: *See—*
Duhl, Daniel, 4,277,527, Cl. 428-109.000.

Polymer Corporation, The: *See—*
Horne, Shek C., 4,276,908, Cl. 138-125.000.
Scheetz, Howard A., 4,277,389, Cl. 260-37.00N.

Pongracz, Endre, to SAPAL Societe Anonyme des Plieuses Automatiques. Wrapping machine. 4,277,731, Cl. 318-685.000.

Porter, Arthur J.: *See—*
Hamilton, James M.; and Porter, Arthur J., 4,277,702, Cl. 307-304.000.

Poshkus, Algirdas C.: *See—*
United States of America, National Aeronautics and Space Administration; and Poshkus, Algirdas C., 4,277,402, Cl. 260-340.90R.

Posner, Howard L., to Perfect Filter Corporation, a part interest. Air filter assembly. 4,277,267, Cl. 55-494.000.

Possati, Mario; and Longhi, Giuliano, to Finike Italiana Marposs S.p.A. Drawer for electric cabinets. 4,277,121, Cl. 312-320.000.

Potthast, Alfred J.: *See—*
Marrs, Graham J.; Oliver, Richard J.; Potthast, Alfred J.; and Samuelson, Roland M., 4,277,041, Cl. 244-182.000.

Potts, Robert S.: *See—*
Rounbehler, David P.; and Potts, Robert S., 4,277,259, Cl. 55-270.000.

Pourprix, Michel: *See—*
Madelaine, Guy; and Pourprix, Michel, 4,277,682, Cl. 250-380.000.

Powers, George W., Jr.; Froning, H. Robert; and Taggart, Davis L., to Standard Oil Company (Indiana). Method for improving sulfonate surfactants used in enhanced recovery processing in subterranean oil-bearing formations. 4,277,351, Cl. 252-8.55D.

PPG Industries, Inc.: *See—*
Cherenko, Joseph; Frey, William I.; Kelly, Joseph D.; and Sokol, Larry S., 4,277,299, Cl. 156-242.000.
Girgis, Mikhail M., 4,277,535, Cl. 428-389.000.
Kellar, John D.; and Pereman, Gordon F., 4,277,276, Cl. 65-106.000.
Orcutt, Dee R., 4,277,294, Cl. 156-102.000.
Picone, Charles E., 4,277,531, Cl. 428-228.000.

Prain, Hunter D.: *See—*
Durant, Graham J.; Emmett, John C.; Ganellin, Charon F.; and Prain, Hunter D., 4,277,485, Cl. 424-272.000.

Precision Mecanique Labinal: *See—*
Leandris, Serge, 4,276,996, Cl. 221-87.000.

Pressler, Wilfried: *See—*
Meidert, Helmut; Pressler, Wilfried; and Muller, Werner H., 4,277,606, Cl. 546-157.000.

Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See—*
Stolarz, Edward M., 4,276,676, Cl. 16-126.000.

Prewarski, Mike: *See—*
McDaniel, Robert F.; Prewarski, Mike; and Ramey, Leonard D., 4,277,188, Cl. 400-257.000.

Price, David W.: *See—*
Davison, Joseph A.; Hall, Graham W.; Hodges, Newton J.; and Price, David W., 4,277,568, Cl. 521-68.000.

Priel, Ury, to National Semiconductor Corporation. Fixed voltage reference circuit. 4,277,739, Cl. 323-313.000.

Procter & Gamble Company, The: *See—*
Logan, Ted J., 4,277,413, Cl. 260-428.500.

Proctor & Gamble Company, The: *See—*
Logan, Ted J., 4,277,412, Cl. 260-428.500.

Prontor-Werk Alfred Gauthier GmbH: *See—*
Rentschler, Waldemar; Starp, Franz; and Espig, Winfried, 4,277,155, Cl. 354-23.00D.

Propst, Paul L.: *See—*
Propst, Robert L.; and Propst, Paul L., 4,277,079, Cl. 280-411.00R.

Propst, Robert L.; and Propst, Paul L., to Herman Miller, Inc. Material handling system. 4,277,079, Cl. 280-411.00R.

Propster, Mark A., to Owens-Corning Fiberglas Corporation. Feeding agglomerates to a glass melting furnace. 4,277,277, Cl. 65-134.000.

Proulx, Sylvester E., to J.P. Tool Ltd. Helical broaching tool for curved surfaces. 4,277,207, Cl. 407-15.000.

Provasnik, Robert, to Siemens Corporation. Temperature sensor for measuring the temperature of a part of an automobile. 4,276,775, Cl. 73-346.000.

Purpi, David C.: *See—*
Keyworth, Donald A.; and Purpi, David C., 4,277,567, Cl. 521-56.000.

Pust, Waldo H. Grain drill utilizing a fertilizer spout and adjustable deflector therefor. 4,276,836, Cl. 111-86.000.

Quin, Michael J. Paint pigment skimmer. 4,277,339, Cl. 210-413.000.

R. Stahl GmbH & Co.: *See—*
Uhrner, Rudolf; Teuke, Klaus; and Schwarz, Wolfgang, 4,277,734, Cl. 318-758.000.

R W M-Raster-Werkzeugmaschinen GmbH: *See—*
Rotzler, Frank, 4,276,823, Cl. 100-257.000.

Raasch, Hans; and Grecksch, Hans, to W. Schlafhorst and Co. Thread-joining device. 4,276,742, Cl. 57-263.000.

Rabitsch, Benjamin F. Irrigation sprinkler. 4,277,029, Cl. 239-232.000.

Rachima, Nissim: *See—*
Chambers, Richard F.; and Rachima, Nissim, 4,277,447, Cl. 423-165.000.

Radlove, Sol B., to Ledges Associates. Premix product for a dietetic cake mix. 4,277,504, Cl. 426-62.000.

Rakowicz, Jan A.: *See—*
Dyett, Derek H.; and Rakowicz, Jan A., 4,276,891, Cl. 131-84.00C.

Ramey, Leonard D.: *See—*
McDaniel, Robert F.; Prewarski, Mike; and Ramey, Leonard D., 4,277,188, Cl. 400-257.000.

Ranger, Ulrich: *See—*
Wanner, Karl; Lehmann, Werner; and Ranger, Ulrich, 4,276,941, Cl. 173-117.000.

Rank, John: *See—*
Thomas, Robert J.; Piekarski, Michael; Morgan, Gary B.; Rank, John; Thurman, William O.; and Lerch, Donald C., 4,277,689, Cl. 250-567.000.

Rasmussen, Glenn; Huston, Larry; Morse, Donald W.; Tsuchiya, Takuzo; Morrison, Clifton H.; Rustad, Stanley C.; and Eiden, Leo, to General Mills, Inc. Fish stick cutting method and apparatus. 4,276,795, Cl. 83-42.000.

Rasor Associates, Inc: *See—*
Tickner, Ernest G.; and Rasor, Ned S., 4,276,885, Cl. 128-660.000.

Rasor, Ned S.: *See—*
Tickner, Ernest G.; and Rasor, Ned S., 4,276,885, Cl. 128-660.000.

Rathmell, William G.: *See—*
Worthington, Paul A.; Rathmell, William G.; and Skidmore, Anthony M., 4,277,469, Cl. 424-245.000.

Ray, Charles D.: *See—*
Dickhudt, Eugene A.; and Ray, Charles D., 4,276,882, Cl. 128-419.00P.

Raytheon Company: *See—*
Davis, Luther, Jr., 4,276,779, Cl. 73-626.000.

RCA Corporation: *See—*
Hinn, Werner, 4,277,798, Cl. 358-33.000.
Hsu, Sheng T., 4,276,688, Cl. 29-571.000.
Rhodes, Roland N., 4,277,801, Cl. 358-55.000.
Rodgers, Robert L., III, 4,277,729, Cl. 315-398.000.
Ross, Michael D., 4,277,796, Cl. 358-8.000.
Webb, Paul P., 4,277,793, Cl. 357-30.000.
Wilber, James A.; and Yorkanis, Bernard J., 4,277,695, Cl. 307-542.000.

Reddig, Horst: *See—*
Keller, Hartmut; Krauth, Axel; Maier, Horst R.; Nink, Horst; Pohlmann, Hans J.; Reddig, Horst; and Siebels, Johann, 4,277,539, Cl. 428-450.000.

Reed, Martin R.: *See—*
Weber, Franz K.; and Reed, Martin R., 4,277,822, Cl. 362-352.000.

Reed, Russell, Jr.; Moore, Kenneth L.; and Meyers, Gary W., to United States of America, Navy. Soil stabilization materials and methods. 4,277,203, Cl. 405-264.000.

Reed Tool Company: *See—*
Wallace, Duane W., 4,277,108, Cl. 308-4.00A.

Regie Nationale des Usines Renault: *See—*
Roue, Yves, 4,277,094, Cl. 296-1.00C.

Rehfeldt, Karl H., to U.S. Philips Corporation. Circuit arrangement for detecting a switching phase. 4,277,795, Cl. 358-8.000.

Reichenberger, Arthur M. Beverage dispensing system. 4,276,999, Cl. 222-129.400.

Reichner, Philip: *See—*
McNab, Ian R.; and Reichner, Philip, 4,277,708, Cl. 310-228.000.

Reid, David L.; and Taylor, Dennis O., to Cummins Engine Company, Inc. Diagnosis of engine turbocharger performance. 4,277,830, Cl. 364-431.000.

Reid, Philip. Apparatus for advancing sheet material. 4,277,302, Cl. 156-466.000.

Reinehr, Dieter; and Pfeifer, Josef, to Ciba-Geigy Corporation. Substituted 11-amino-undeca-4,8-dienal and 11-amino-undecanal derivatives and processes for their preparation. 4,277,621, Cl. 564-250.000.

Reinke, Kurt: *See—*
Biermann, Kurt; and Reinke, Kurt, 4,276,837, Cl. 112-152.000.

Rello, Michael J., to Exxon Research & Engineering Co. Ribbon locating means. 4,277,187, Cl. 400-248.000.

Reneau, Paul A. Environmental signal switch for motor vehicles. 4,277,813, Cl. 361-173.000.

Rentschler, Waldemar; Starp, Franz; and Espig, Winfried, to Prontor-Werk Alfred Gauthier GmbH. Control device for photographic cameras. 4,277,155, Cl. 354-23.00D.

Repa Feinstanzwerk GmbH: *See—*
Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, 4,277,036, Cl. 242-107.40A.

Resfar S.r.l.: *See—*
Vandoni, Guido, 4,277,489, Cl. 424-274.000.

Reussner, George H.; and Thiessen, Reinhardt, Jr, to General Foods Corporation. Preventing tooth demineralization using aspartame. 4,277,464, Cl. 424-177.000.

Reynolds Metals Company: *See—*
Matthews, Stephen B.; Loredo, Tomas A.; Knox, Walter H., III; and Simmons, Herman F., 4,277,594, Cl. 526-352.000.
Weston, David, 4,277,446, Cl. 423-136.000.

Rhodes, Roland N., to RCA Corporation. Color filter having vertical color stripes with a nonintegral relationship to CCD photosensors. 4,277,801, Cl. 358-55.000.

Rhodes, Ronald J.: *See—*
Bartlett, Charles J.; Rhodes, Ronald J.; and Rust, Ray D., 4,277,321, Cl. 204-192.00E.

Rhone-Progil: *See—*
Fournel, Francis; and Soussan, Salomon, 4,277,585, Cl. 526-65.000.

Ricci, Louis N.: *See—*
Maier, Alfred E.; and Ricci, Louis N., 4,277,664, Cl. 200-293.000.

Richards, M. David. Protective watch cover. 4,277,842, Cl. 368-282.000.

Richards, William D., to American Optical Corporation. Soft contact lens apparatus. 4,277,172, Cl. 356-244.000.

Richardson, Mason E., to Van Products Company. Fluid level indicator (vent holes). 4,276,694, Cl. 33-126.70R.

Richardson-Merrell Inc.: *See—*
Bey, Philippe; Metcalf, Brian W.; and Wiseman, Jeffrey S., 4,277,395, Cl. 260-112.50R.

Richter Gedeon Vegyeszeti Gyar RT: *See—*
Takacs, Istvan; Rudolf, Peter; Szabo, Bela; and Kerey, Gyorgy, 4,276,701, Cl. 34-109.000.

Ricoh Company, Ltd.: *See—*
Fukushima, Yoshio; and Kanmoto, Yoshiaki, 4,277,156, Cl. 354-25.000.
Ikesue, Masumi; Yano, Takashi; Tatsumi, Susumu; Idenawa, Hiroyuki; Nakamura, Isao; and Tani, Tatsuo, 4,277,163, Cl. 355-14.00R.
Kasahara, Nobuo; and Yamanobe, Kouji, 4,277,162, Cl. 355-14.00R.
Kawamura, Atsushi, 4,277,128, Cl. 350-6.800.
Miyagawa, Fumihiro; and Sawabe, Kousaku, 4,277,157, Cl. 354-187.000.
Sato, Yojiro, 4,277,805, Cl. 358-286.000.
Tatsumi, Susumu; Eda, Tadahiro; and Imai, Chikara, 4,277,549, Cl. 430-30.000.

Riedel, Tilo, to S.A. Etablissements Francois Salomon & Fils. Ski brake. 4,277,082, Cl. 280-605.000.

Riediger, Craig W.: *See—*
Kuhfuss, Alvin L., Jr.; and Riediger, Craig W., 4,276,952, Cl. 180-294.000.

Rieger, Frank W.: *See—*
Dent, Thomas H.; Jordan, Diane E.; King, William E.; and Rieger, Frank W., 4,276,856, Cl. 122-382.000.

Rieger, Franz: *See—*
Muller, Klaus; Maurer, Helmut; Linder, Ernst; Rieger, Franz; and Ziegler, Bodo, 4,277,323, Cl. 204-195.00S.

Riess, Axel, to J. & J. Marquardt. Basic electric switch with an additional switch portion. 4,277,661, Cl. 200-157.000.

Riggins, Oral L., to Westinghouse Electric Corp. Power spark gap for high current conduction. 4,277,719, Cl. 313-325.000.

Rios, Pedro A., to Electric Power Research Institute. Method and apparatus for cooling a winding in the rotor of an electrical machine. 4,277,705, Cl. 310-64.000.

Rivers, Charles F. Front loading, side unloading dumper. 4,277,219, Cl. 414-421.000.

RK Industries: *See—*
Roth, Verlon C., 4,276,902, Cl. 137-505.180.

Robert Bosch GmbH: *See—*
Dinkelacker, Walter; and Knoedler, Juergen, 4,277,752, Cl. 324-399.000.
Muller, Karl-Heinz, 4,277,230, Cl. 418-131.000.
Muller, Klaus; Maurer, Helmut; Linder, Ernst; Rieger, Franz; and Ziegler, Bodo, 4,277,323, Cl. 204-195.00S.
Wanner, Karl; Lehmann, Werner; and Ranger, Ulrich, 4,276,941, Cl. 173-117.000.

Roberts, Sidney N.: *See—*
Wright, Douglas C.; and Roberts, Sidney N., 4,277,330, Cl. 209-459.000.

Robey, Roger L.: *See—*
Zimmerman, Dennis M.; and Robey, Roger L., 4,277,608, Cl. 546-339.000.

Robinson, Prentice: *See—*
Howard, Robert; Robinson, Prentice; and Vitale, Alexander F., 4,277,189, Cl. 400-320.000.

Robison, Elburn. System for viewing the area rearwardly of a vehicle. 4,277,804, Cl. 358-108.000.

Rockwell International Corporation: *See—*
Beguwala, Moiz M. E.; and Erdmann, Francis M., 4,277,320, Cl. 204-164.000.
Smith, Dale K.; Donich, Thomas G.; Dickerson, Bobby V.; and Leader, Raymond E., 4,277,845, Cl. 455-52.000.
Smith, Elroy C., Jr., 4,277,517, Cl. 427-96.000.

Rockwell-Rimoldi, S.p.A.: *See—*
Torre, Giancarlo D., 4,276,842, Cl. 112-322.000.

Rodgers, Robert L., III, to RCA Corporation. Simplified vertical deflection circuit. 4,277,729, Cl. 315-398.000.

Rodriguez, Luis F.; and Crawford, Thomas J. Neutron poison test device for high density spent fuel storage racks. 4,277,680, Cl. 250-358.00R.

Rogemoser, David R.: *See—*
Williams, Roy C.; and Rogemoser, David R., 4,277,380, Cl. 260-18.0TN.

Roger, Francoise M. M.: *See—*
Boudot, Jean E.; Roger, Francoise M. M.; and Jeanmaire, Michel P. H., 4,277,285, Cl. 106-52.000.

Rogers, Robert D. Puppet. 4,276,715, Cl. 46-154.000.

Rogic, Milorad M.: *See—*
Demmin, Timothy R.; and Rogic, Milorad M., 4,277,419, Cl. 260-465.400.

Rohm and Haas Company: *See—*
Arkens, Charles T., 4,277,384, Cl. 260-29.6RB.
Jordan, Arthur D., Jr.; and Lavelle, Joseph A., 4,277,387, Cl. 260-29.70H.
Nyi, Kayson; and Graham, Sandra I., 4,277,319, Cl. 204-159.230.

Rohrbacher, Hans-Adolf, to Kernforschungszentrum Karlsruhe GmbH. Time code generator. 4,277,779, Cl. 340-348.000.

Romano, Paul L., to Acoustic Standards. Adjustable light and air-admitting window thermal and acoustic barrier system. 4,276,954, Cl. 181-224.000.

Ronco Teleproducts, Inc.: *See—*
Stansbury, Benjamin H., Jr., 4,276,695, Cl. 33-141.00E.

Root, Myron A. Three-wheel conveyance. 4,277,078, Cl. 280-269.000.

Rosaia, Albert H., to Peck & Hale, Inc. Connector interconnecting freight devices. 4,277,212, Cl. 410-78.000.

Rose, Richard L.: *See—*
Modler, Peter R.; Dittmer, Harold E.; Rose, Richard L.; and Stafsnes, John A., 4,276,752, Cl. 62-166.000.

Rosen, Melvin H., to Ciba-Geigy Corporation. 1-Benzothiepin-4-carboxamides. 4,277,484, Cl. 424-267.000.
Rosenqvist, Lars. Irrigation device. 4,276,900, Cl. 137-355.210.
Rosenstock, Guenter; and Kindler, Wilfried, to Siemens Aktiengesellschaft. Ink controlling device for ink printing equipment in office machines and the like. 4,277,791, Cl. 346-140.00R.
Rosenthal Technik AG: *See*—
Keller, Hartmut; Krauth, Axel; Maier, Horst R.; Nink, Horst; Pohlmann, Hans J.; Reddig, Horst; and Siebels, Johann, 4,277,539, Cl. 428-450.000.
Rosier, Charles D.; Pan, Jing-Jong; and Belcher, Donald K., to Harris Corporation. Microwave transistor stabilization circuit. 4,277,764, Cl. 333-24.00C.
Ross, Michael D., to RCA Corporation. Slow down color processor for video disc mastering using a special mode VTR. 4,277,796, Cl. 358-8.000.
Ross, Peter, to Stop-A-Flat Corporation. Delivery system for pneumatic vessels. 4,276,898, Cl. 137-231.000.
Roth, Verlon C., to RK Industries. Modular fluid pressure regulator valves. 4,276,902, Cl. 137-505.180.
Rotzler, Frank, to R W M-Raster-Werkzeugmaschinen GmbH. Eccentric press. 4,276,823, Cl. 100-257.000.
Roue, Yves, to Regie Nationale des Usines Renault. Device for the remote-controlled closing of a gasoline vent. 4,277,094, Cl. 296-1.00C.
Rounbehler, David P.; and Potts, Robert S., to Thermo Electron Corporation. Air-sampling cartridge. 4,277,259, Cl. 55-270.000.
Rouse, Michael F. Arrow for blood tracking. 4,277,069, Cl. 273-418.000.
Rousseau, Jean-Claude: *See*—
Duhayon, Jacques; Goumondy, Jean-Pierre; Leudet, Alain; and Rousseau, Jean-Claude, 4,277,363, Cl. 252-301.10W.
Roussel Uclaf: *See*—
Bulidon, Jacques; and Pavan, Charles, 4,277,607, Cl. 546-179.000.
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Teche, Andre, 4,277,617, Cl. 560-124.000.
Pavan, Charles; and Bulidon, Jacques, 4,277,408, Cl. 260-397.100.
Warnant, Julien; and Jolly, Jean, 4,277,409, Cl. 260-397.450.
Rouverol, William S. Low-noise gearing. 4,276,785, Cl. 74-462.000.
Rowland, Stanley P., to United States of America, Agriculture. Process for producing durable-press cotton fabrics with improved balances of textile properties. 4,277,243, Cl. 8-183.000.
Ruber, Klaus; and Zill, Karl, to Hoechst Aktiengesellschaft. Device for laying down continuous material by means of a pair of profiled rolls. 4,276,682, Cl. 28-289.000.
Rudolf, Peter: *See*—
Takacs, Istvan; Rudolf, Peter; Szabo, Bela; and Kerey, Gyorgy, 4,276,701, Cl. 34-109.000.
Rudy, Michael W.; Horning, Thomas D.; and Kraemer, Edward J., to Terminal Data Corporation. Indicia printer. 4,277,190, Cl. 400-582.000.
Ruedin, Yves: *See*—
Saurer, Eric; Gharadjedaghi, Fereydoun; Laesser, Claude; Viennet, Rene; and Ruedin, Yves, 4,277,144, Cl. 350-349.000.
Rufer, Willy; and Menzi, Robert, to Battelle Memorial Institute. Process for the manufacture of a foodstuff having a fibrous structure similar to that of meat. 4,277,513, Cl. 426-656.000.
Ruidisch, Louis E.; and Van Wagenen, Sterling O., to Texaco Inc. Oil and debris skimmer. 4,277,334, Cl. 210-154.000.
Rusay, Ronald J., to Stauffer Chemical Company. Certain 2-hydroxy-1-naphthaldehyde acylhydrazones and their use as fungicides. 4,277,500, Cl. 424-324.000.
Rusch, Gordon K.; Keefe, Donald J.; and McDowell, William P., to United States of America, Energy. Count-doubling time safety circuit. 4,277,308, Cl. 176-19.0EC.
Russell, Charles R.: *See*—
Shasha, Baruch S.; Doane, William M.; and Russell, Charles R., 4,277,364, Cl. 252-316.000.
Rust, Ray D.: *See*—
Bartlett, Charles J.; Rhodes, Ronald J.; and Rust, Ray D., 4,277,321, Cl. 204-192.00E.
Rustad, Stanley C.: *See*—
Rasmussen, Glenn; Huston, Larry; Morse, Donald W.; Tsuchiya, Takuzo; Morrison, Clifton H.; Rustad, Stanley C.; and Eiden, Leo, 4,276,795, Cl. 83-42.000.
Ryer, Jack: *See*—
Brois, Stanley J.; Ryer, Jack; and Winans, Esther D., 4,277,354, Cl. 252-51.50R.
Deen, Harold E.; O'Halloran, Rosemary; Winans, Esther D.; Ryer, Jack; and Brois, Stanley J., 4,277,353, Cl. 252-51.50R.
Ryr, Karl A.: *See*—
Branden, Leif; Bruun, Jan F.; Holm, Olle; Mellgren, Ronnie E.; Ryr, Karl A.; Stromer, Carl-Axel; and Tronslien, Erling, 4,277,652, Cl. 179-100.00D.
Saab-Scania AB: *See*—
Torby, Arne, 4,277,788, Cl. 343-113.00R.
Sachs, Emanual M., to Mobil Tyco Solar Energy Corporation. Apparatus for monitoring crystal growth. 4,277,441, Cl. 422-105.000.
Sagoian, Lenik N.: *See*—
Barsukov, Vyacheslav Z.; Dunovsky, Sergei A.; Sagoian, Lenik N.; Trepalin, Anatoly I.; Aguf, Igor A.; and Smolkova, Valentina S., 4,277,546, Cl. 429-59.000.
Sahley, Lloyd W., to Syndrill Carbide Diamond Company. Self renewing working tip mining pick. 4,277,106, Cl. 299-79.000.
Saint Gobain Industries: *See*—
Meunier, Georges, 4,277,205, Cl. 406-123.000.
St. Jude Medical, Inc.: *See*—
Hanson, Donald W.; and Palmquist, William E., 4,276,658, Cl. 3-1.500.
Saito, Naoyuki: *See*—
Tsujii, Kaoru; Saito, Naoyuki; and Kawai, Michio, 4,277,378, Cl. 252-546.000.
Saito, Tadao: *See*—
Tsukada, Takami; Akutsu, Masao; and Saito, Tadao, 4,276,986, Cl. 215-1.00C.
Saito, Toshihiro; Tsutsumi, Yukihiro; Arai, Shoji; and Matsunaga, Hideaki, to Toyo Soda Manufacturing Co., Ltd. Process for producing catalyst. 4,277,414, Cl. 260-429.00R.
Saito, Yoshijiro: *See*—
Kagami, Toshio; Saito, Yoshijiro; Matsushita, Shigeru; and Iriuchijima, Kunio, 4,277,388, Cl. 260-33.40R.
Sakabinos, Steven, to Eltra Corporation. Optical system for electro-optical scanner. 4,277,154, Cl. 354-5.000.
Sakakibara, Shumpei; Kumahara, Yuichi; Okada, Yoshiaki; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tsushima, Shoichiro, to Daiichi Radioisotope Laboratories, Ltd. Radioimmunoassay method for determining calcitonin and radioactive tracer for use therein. 4,277,393, Cl. 260-112.50R.
Sakamoto, Kenro: *See*—
Koboshi, Sigeharu; Fushiki, Isamu; and Sakamoto, Kenro, 4,277,556, Cl. 430-393.000.
Sakotani, Akio; and Gomi, Tohru, to Katsukawa, Heitaro. Treating agents for waste water containing dyes and/or other organic substances, a process for treating said waste water by using the same. 4,277,346, Cl. 210-691.000.
Saliger, Kenneth C.; and Jansen, Martin B., to NL Industries, Inc. Well casing hanger assembly. 4,276,932, Cl. 166-214.000.
Saligny, Yves, to Etablissements Carpano and Pons. Connecting member for telephone systems. 4,277,643, Cl. 179-1.0PC.
Salomatin, Viktor M.; Belyanin, Petr N.; and Pestrikov, Vladimir I. Telescopic jib for load-handling device. 4,276,727, Cl. 52-115.000.
Saltzman, Robert N.; and Burrell, Bruce. Ice making machine. 4,276,751, Cl. 62-138.000.
Salvadore, John M.: *See*—
Heibein, Harry P.; Millington, Richard G.; Salvadore, John M.; Scott, Dean J.; and Sendelweck, Michael L., 4,277,790, Cl. 346-75.000.
Sampieri, Eugene E.; and Sosnowski, Thomas P., to Bell Telephone Laboratories, Incorporated. Light pen tracking method and apparatus. 4,277,783, Cl. 340-708.000.
Sams, Terry L., to Western Electric Company, Inc. Apparatus and method for resetting data sets. 4,277,646, Cl. 179-2.0DP.
Samuelson, Roland M.: *See*—
Marrs, Graham J.; Oliver, Richard J.; Potthast, Alfred J.; and Samuelson, Roland M., 4,277,041, Cl. 244-182.000.
Sanchez, Edward J. Reciprocating shingle remover with upward thrust blade. 4,277,104, Cl. 299-37.000.
Sandberg, Glenn A.; and Janssen, Wilbur A., to Formax, Inc. Cryogenic freezing tunnel control system. 4,276,753, Cl. 62-186.000.
Sandegard, Jan. Splint for extremities. 4,276,875, Cl. 128-89.00R.
Sanders, Daniel E.: *See*—
Turner, Nelson R.; Sanders, Daniel E.; and Bienenstein, Charles A., 4,277,087, Cl. 280-718.000.
Sandner, Michael R.: *See*—
Matlock, Paul L.; and Sandner, Michael R., 4,277,318, Cl. 204-78.000.
Sandoz Ltd.: *See*—
Vigouret, Jean-Marie, 4,277,481, Cl. 424-261.000.
Sano, Yasukazu, to Fuji Electric Co., Ltd. Automatic product checking system. 4,277,803, Cl. 358-106.000.
SAPAL Societe Anonyme des Plieuses Automatiques: *See*—
Pongracz, Endre, 4,277,731, Cl. 318-685.000.
Sartorius GmbH: *See*—
Knothe, Erich; Berg, Christoph; and Melcher, Franz J., 4,276,949, Cl. 177-212.000.
Sasaki, Sei'ichi, to Kabushiki Kaisha Keiheisha. Disk projector and catcher. 4,277,068, Cl. 273-324.000.
Sasaki, Takashi: *See*—
Kikuchi, Shoji; Yajima, Toshio; Kishi, Kenichi; Sasaki, Takashi; Mori, Keiichi; and Sato, Haruhiko, 4,277,558, Cl. 430-542.000.
Sassmannshausen, Knut O. Lamp. 4,277,821, Cl. 362-346.000.
Sato, Haruhiko: *See*—
Kikuchi, Shoji; Yajima, Toshio; Kishi, Kenichi; Sasaki, Takashi; Mori, Keiichi; and Sato, Haruhiko, 4,277,558, Cl. 430-542.000.
Sato, Kazuhiro: *See*—
Koike, Norio; Takemoto, Iwao; Kubo, Masaharu; Sato, Kazuhiro; and Nagahara, Shusaku, 4,277,799, Cl. 358-44.000.
Sato, Kozo, to Tokyo Shibaura Electric Company, Limited. Static type circuit breaker. 4,277,811, Cl. 361-101.000.
Sato, Kunito; Miller, Alfred F.; and Zimont, Leonard J., to Armour and Company. Cured meat product and process for preparing the same. 4,277,508, Cl. 426-266.000.
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, to Olympus Optical Co., Ltd. Tape running direction indicator. 4,277,674, Cl. 235-92.0EA.
Sato, Naoki: *See*—
Yoshimoto, Takeo; Igarashi, Keiichi; Oda, Kengo; Ura, Masaaki; and Sato, Naoki, 4,277,624, Cl. 568-44.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Constant pressure assembly for hand operated label printing machine. 4,276,828, Cl. 101-291.000.

Sato, Yojiro, to Ricoh Company, Ltd. Combination copying-facsimile reproduction apparatus. 4,277,805, Cl. 358-286.000.

Satoh, Ken: *See*—
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,277,674, Cl. 235-92.0EA.

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Landauer, Franz; and Schaeffer, Georg, 4,277,421, Cl. 570-185.000.

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Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, 4,277,036, Cl. 242-107.40A.

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Johne, Hans; Jentzsch, Arndt; Schmidt, Lothar; Muller, Wolfgang; and Funke, Mandred, 4,276,827, Cl. 101-212.000.

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Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, 4,277,418, Cl. 260-465.400.

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Carroll, Howard E.; and Sweitzer, Gerald M., 4,277,385, Cl. 260-29.6RW.

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Schlosberg, Richard H.; and Scouten, Charles G., 4,277,326, Cl. 208-263.000.

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Fausone, Alfredo; and Seano, Vittorio, 4,277,755, Cl. 330-128.000.

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Walker, Benjamin M., 4,277,569, Cl. 521-92.000.

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Colombo, Antonio, 4,277,730, Cl. 315-408.000.

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Cerofolini, Gianfranco; and Ferla, Giuseppe, 4,277,291, Cl. 148-1.500.

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Haaf, William R.; and Shank, Charles P., 4,277,575, Cl. 525-89.000.

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Deguchi, Masanobu; and Ikegami, Takeshi, 4,276,978, Cl. 198-654.000.

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Zijlstra, Kornelis N., 4,276,942, Cl. 175-21.000.

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Kawamura, Hiromitsu; Nakajima, Tokuyoshi; and Shibuya, Yoshimichi, 4,277,275, Cl. 65-43.000.

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Nonaka, Yasuhiko; Goto, Naohiro; and Shidara, Keiichi, 4,277,515, Cl. 427-76.000.

Shiga, Yoshinobu; Kage, Ryusuke; and Iwata, Masakatsu, to Nippon Light Metal Company Limited. Flashing construction for a curtain wall. 4,276,729, Cl. 52-209.000.

Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu. Torsional vibration monitoring apparatus for rotating shaft system. 4,276,782, Cl. 73-650.000.

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Inamine, Shigeo; Matsuda, Toshio; and Shimomura, Takeo, 4,277,512, Cl. 426-549.000.

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Fujino, Masahiko; Shinagawa, Susumu; and Kawai, Kiyohisa, 4,277,394, Cl. 260-112.50R.

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Shivers, Charles B., Jr. Carburetor for internal combustion engines. 4,277,424, Cl. 261-41.00D.

Shrader, Merrald B., to Varian Associates, Inc. Modular electron tube with carbon grid. 4,277,718, Cl. 313-304.000.

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Kuntz, David H.; and Ingram, James A., 4,276,889, Cl. 128-761.000.

Sibley, Alfred E. Blood pressure recorder. 4,276,886, Cl. 128-681.000.

Sibrava, Joseph S.; and Caroselli, Frank E., to Arvey Corporation. Pressure sensitive tape closure pouch. 4,276,982, Cl. 206-439.000.

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Lindtveit, Herbert, 4,276,871, Cl. 126-292.000.

Siebels, Johann: *See*—
Keller, Hartmut; Krauth, Axel; Maier, Horst R.; Nink, Horst; Pohlmann, Hans J.; Reddig, Horst; and Siebels, Johann, 4,277,539, Cl. 428-450.000.

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Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, 4,277,516, Cl. 427-81.000.
Dangschat, Rainer; Jeschke, Alfred; Leichtl, Helmut; and Winkler, Wolfgang, 4,277,797, Cl. 358-21.00R.
Feuerbaum, Hans P., 4,277,679, Cl. 250-310.000.
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Stuwe, Botho; and Vobel, Wilhelm, 4,277,115, Cl. 308-26.000.
Voss, Peter, 4,277,307, Cl. 176-10.000.

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Provasnik, Robert, 4,276,775, Cl. 73-346.000.

Sigouin, Roger. Tree processing unit. 4,276,918, Cl. 144-2.00Z.

Sih, John C., to Upjohn Company, The. 11-Deoxy-11-hydroxymethyl-inter-phenylene-19-oxo-PGE_1 compounds. 4,277,611, Cl. 560-53.000.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-19-methyl-6-oxo-PGF_1 intermediates. 4,277,613, Cl. 560-121.000.

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Sime, Sylvan H., 4,277,656, Cl. 200-47.000.

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Matthews, Stephen B.; Loredo, Tomas A.; Knox, Walter H., III; and Simmons, Herman F., 4,277,594, Cl. 526-352.000.

Simon, Francois. Lifting and handling equipment unit, especially for shipside operations. 4,277,053, Cl. 254-326.000.

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Lacefield, William B.; and Simon, Richard L., 4,277,471, Cl. 424-248.400.
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Drake, Samuel H.; and Simunovic, Sergio N., 4,276,697, Cl. 33-169.00C.

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Kuliev, Aladdin M. O.; Kadyrov, Tokhrul A. O.; Gaibov, Gjuloglan G. O.; Sinaisky, Anatoly G.; and Matiyasevich, Valentina N., 4,277,390, Cl. 260-37.0EP.

Singer Company, The: *See*—
Ljung, Bo H. G., 4,276,924, Cl. 164-130.000.
Ljung, Bo H. G.; and Ferriss, Lincoln S., 4,277,173, Cl. 356-350.000.
Weisz, William, 4,276,841, Cl. 112-317.000.

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van Nederveen, Hans B., 4,276,788, Cl. 76-108.00A.

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Worthington, Paul A.; Rathmell, William G.; and Skidmore, Anthony M., 4,277,469, Cl. 424-245.000.

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Small, Kenneth T., to Tab Products Company. Continuous power source with bi-directional converter. 4,277,692, Cl. 307-66.000.

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Smith, Dale K.; Donich, Thomas G.; Dickerson, Bobby V.; and Leader, Raymond E., to Rockwell International Corporation. Meteor scatter burst communication system. 4,277,845, Cl. 455-52.000.

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Smith, Elroy C., Jr., to Rockwell International Corporation. Method of forming transparent conductor pattern. 4,277,517, Cl. 427-96.000.

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Geczy, Bela, 4,276,944, Cl. 175-102.000.
Hebel, James B., 4,276,947, Cl. 175-321.000.

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Durant, Graham J.; Emmett, John C.; Ganellin, Charon F.; and Prain, Hunter D., 4,277,485, Cl. 424-272.000.

Smith, William L.: *See—*
Jessop, Thomas C.; and Smith, William L., 4,277,440, Cl. 422-100.000.

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Smitty's, Inc.: *See—*
Smith, Alexander; and Baggs, Burton D., 4,277,080, Cl. 280-473.000.

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Barsukov, Vyacheslav Z.; Dunovsky, Sergei A.; Sagoian, Lenik N.; Trepalin, Anatoly I.; Aguf, Igor A.; and Smolkova, Valentina S., 4,277,546, Cl. 429-59.000.

Sneijers, Andreas P. E., to U.S. Philips Corporation. Gas and/or vapor discharge lamp. 4,277,725, Cl. 315-73.000.

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Wise, William F.; and Snyder, Jesse E., Jr., 4,277,341, Cl. 210-602.000.

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Lalanne, Andre P., 4,277,097, Cl. 296-37.160.

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Bugaut, Andree; and Andrillon, Patrick, 4,277,244, Cl. 8-410.000.

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Riedel, Tilo, 4,277,082, Cl. 280-605.000.

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Dore, Alain; and Judet, Henri, 4,276,698, Cl. 33-174.00L.

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Lalanne, Andre P., 4,277,097, Cl. 296-37.160.

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Lalancette, Jean M., 4,277,596, Cl. 528-106.000.

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Lalancette, Jean-Marc, 4,277,449, Cl. 423-167.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Dubois, Claude; and Surdi, Jean M., 4,277,225, Cl. 416-198.00A.

Soes, Lucas, to AMP Incorporated. Electrical switch. 4,277,663, Cl. 200-283.000.

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Cherenko, Joseph; Frey, William I.; Kelly, Joseph D.; and Sokol, Larry S., 4,277,299, Cl. 156-242.000.

Solomon, Alan. Disposable orthopedic implement and method. 4,277,184, Cl. 366-150.000.

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Collins, Robert W.; Hoffman, Roy L.; Loen, Larry W.; Mitchell, Glen R.; and Soltis, Frank G., 4,277,826, Cl. 364-200.000.

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Michel, Edmond, 4,276,987, Cl. 215-1.00C.

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Sampieri, Eugene E.; and Sosnowski, Thomas P., 4,277,783, Cl. 340-708.000.

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Fournel, Francis; and Soussan, Salomon, 4,277,585, Cl. 526-65.000.

Southwire Company: *See—*
Jeter, David R., 4,277,011, Cl. 226-199.000.
Weber, John G.; and Chia, E. Henry, 4,277,281, Cl. 75-93.00R.

Spalding, George, to Diemakers, Inc. Composite power cylinder. 4,276,994, Cl. 220-454.000.

Spangler, Carl D., Jr., to Conoco, Inc. Heat pump fractionation process. 4,277,268, Cl. 62-26.000.

Spanner, W. F. Ice cutting and breaking vessel. 4,276,845, Cl. 114-42.000.

Spanoudis, Louis, to Owens-Illinois, Inc. Method for braze-assembling metal components having low softening temperatures, without disrupting regions of stabilized dimensions. 4,277,013, Cl. 228-136.000.

Speakman, Eugene R., to McDonnell Douglas Corporation. Structure to retard fretting and method of manufacture. 4,277,200, Cl. 403-408.000.

Spector, Donald. Self-stick aroma-dispensing tab. 4,277,024, Cl. 239-36.000.

Spirk, Franz, to Siemens Aktiengesellschaft. Large diameter synchronous electric machine. 4,277,709, Cl. 310-261.000.

Spohr, Hanswerner. Control valve. 4,276,903, Cl. 137-554.000.

Spoor, Herbert: *See—*
Straub, Ferdinand; Spoor, Herbert; and Cordes, Claus, 4,277,576, Cl. 525-123.000.

Sprunck, Emile: *See—*
Zanetta, Hugues, 4,277,054, Cl. 266-268.000.

Staehle, Dale O., to Western Publishing Company. Microscope. 4,277,133, Cl. 350-90.000.

Stafsnes, John A.: *See—*
Modler, Peter R.; Dittmer, Harold E.; Rose, Richard L.; and Stafsnes, John A., 4,276,752, Cl. 62-166.000.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; Lillie, Christian; and Pichler, Ludwig, to Boehringer Ingelheim GmbH. Substituted 2-phenylamino-2-imidazolines as bradycardiacs. 4,277,487, Cl. 424-273.00R.

Stahlecker, Fritz; and Zilian, Dietrich, to Stahlecker, Fritz; and Stahlecker, Hans. Method and apparatus for start-spinning a thread on an open-end spinning unit. 4,276,741, Cl. 57-263.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Zilian, Dietrich, 4,276,741, Cl. 57-263.000.

Stahler, Gerhard: *See—*
Sinharay, Akhileswar; Stahler, Gerhard; and Bonin, Werner, 4,277,493, Cl. 424-304.000.

Stahly, Daniel C.; Scott, William H.; and Wagdy, Mohamed K., to Sunbeam Corporation. Food mixer. 4,277,181, Cl. 366-69.000.

Stamicarbon, B.V.: *See—*
Kerkhoffs, Pieter L., 4,277,563, Cl. 435-99.000.

Standard Car Truck Company: *See—*
Bullock, Robert L., 4,276,833, Cl. 105-197.0DB.

Standard Oil Company (Indiana): *See—*
Karayannis, Nicholas M.; and Skryantz, John S., 4,277,370, Cl. 252-429.00B.
Powers, George W., Jr.; Froning, H. Robert; and Taggart, Davis L., 4,277,351, Cl. 252-8.55D.

Standard Products Company, The: *See—*
Jackson, Norman C., 4,277,526, Cl. 428-31.000.

Stanford, Ralph F.: *See—*
Christensen, Donald R.; and Stanford, Ralph F., 4,277,002, Cl. 222-349.000.

Stansbury, Benjamin H., Jr., to Ronco Teleproducts, Inc. Roller measure device. 4,276,695, Cl. 33-141.00E.

Starp, Franz: *See—*
Rentschler, Waldemar; Starp, Franz; and Espig, Winfried, 4,277,155, Cl. 354-23.00D.

Stauffer Chemical Company: *See—*
Rusay, Ronald J., 4,277,500, Cl. 424-324.000.

Steffen, David E., to Dickey-john Corporation. Planter population monitor. 4,277,833, Cl. 364-555.000.

Stein, Arthur A.: *See—*
Goldman, Max; and Stein, Arthur A., 4,276,819, Cl. 98-115.0LH.

Stein, Reinhardt P., to American Home Products Corporation. Sydnone imines. 4,277,609, Cl. 548-125.000.

Steinbeck, Hermann: *See—*
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, 4,277,468, Cl. 424-243.000.

Steinberg, Mitchell I.: *See—*
Molloy, Bryan B.; and Steinberg, Mitchell I., 4,277,501, Cl. 424-330.000.

Stendel, Wilhelm: *See—*
Sirrenberg, Wilhelm; Klauke, Erich; Marhold, Albrecht; Hammann, Ingeborg; Stendel, Wilhelm; and Krehan, Ingomar, 4,277,499, Cl. 424-322.000.

Stenkvist, Sven-Einar, to ASEA Aktiebolag. Prefabricated unit for a DC arc furnace. 4,277,638, Cl. 13-35.000.

Stephan, Rudolf: *See—*
Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, 4,277,418, Cl. 260-465.400.

Sterki, Armin; Sommer, Gerd R.; and Naegeli, Walter, to Maag Gear Wheel & Machine Co. Ltd. Method and test apparatus for testing the tooth flank profile of large diameter gears. 4,276,699, Cl. 33-179.50R.

Sterner, Charles J.: *See—*
Kwasnoski, Daniel; and Sterner, Charles J., 4,277,311, Cl. 202-183.000.

Stevens, Carlile R., to Stevens Luminoptics. Power supply for a high intensity discharge or fluorescent lamp. 4,277,728, Cl. 315-307.000.

Stevens Luminoptics: *See—*
Stevens, Carlile R., 4,277,728, Cl. 315-307.000.

Stiegler, Karl Heinz: *See—*
Schulze, Ehrhart, 4,277,241, Cl. 493-196.000.

Stiel, Karl: *See—*
Pauli, Arthur G.; Schade, Reinhart; and Stiel, Karl, 4,277,143, Cl. 350-334.000.

Stolarz, Edward M., to Presto Lock Company, Division of Walter Kidde & Company, Inc. Handle mounting device. 4,276,676, Cl. 16-126.000.

Stone, Samuel L. Security bolts for trailer wheels. 4,277,107, Cl. 301-13.0SM.

Stop-A-Flat Corporation: *See—*
Ross, Peter, 4,276,898, Cl. 137-231.000.

Storage Technology Corporation: *See—*
Hancock, Robert J.; Burns, William A.; and Hall, James B., 4,277,844, Cl. 371-38.000.

Storz, Karl. Injection syringe. 4,276,878, Cl. 128-218.0PA.

Stoutenburg, Garnet H. Bumper trailer hitch. 4,277,081, Cl. 280-502.000.

Straub, Ferdinand; Spoor, Herbert; and Cordes, Claus, to BASF Aktiengesellschaft. Preparation of modified polymers of N-vinylpyrrolid-2-one and their use for the preparation of polymers interrupted by bridge members. 4,277,576, Cl. 525-123.000.

Streicher, Kurt; and zur Nieden, Achim, to Klockner-Humboldt-Deutz Aktiengesellschaft. Pressure lubrication for internal combustion engines. 4,276,859, Cl. 123-196.00R.

Streifer, William: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,277,762, Cl. 331-94.50H.

Strobel, Gary A., to Endowment and Research Foundation at Montana State University. Method for treating Dutch elm disease using *P. syringae*. 4,277,462, Cl. 424-93.000.

Strobel, Herbert, to Heckler & Koch GmbH. Method for continuous path control of a machine tool. 4,276,792, Cl. 82-1.00C.

Stromer, Carl-Axel: *See*—
Branden, Leif; Bruun, Jan F.; Holm, Olle; Mellgren, Ronnie E.; Ryr, Karl A.; Stromer, Carl-Axel; and Tronslien, Erling, 4,277,652, Cl. 179-100.00D.

Stuckert, Paul E., to International Business Machines Corporation. Personal portable terminal for financial transactions. 4,277,837, Cl. 364-900.000.

Stuwe, Botho; and Vobel, Wilhelm, to Siemens Aktiengesellschaft. Mount for calotte bearings. 4,277,115, Cl. 308-26.000.

Suba, Virgilio. Automatically-inflatable life preserver. 4,276,669, Cl. 9-313.000.

Sugasawa, Fukashi; Iizuka, Haruhiko; and Matsumoto, Junichiro, to Nissan Motor Company, Limited. Apparatus for controlling the number of enabled cylinders of an internal combustion engine upon deceleration. 4,276,863, Cl. 123-481.000.

Sugerman, Gerald; and Monte, Salvatore J., to Kenrich Petrochemicals, Inc. Pyrophosphato titanate adducts. 4,277,415, Cl. 260-429.500.

Sugier, Andre; Courty, Philippe; Deschamps, Andre; and Gruhier, Henri, to Institut Francais du Petrole. Process for oxidizing sulfur and sulfur compounds. 4,277,458, Cl. 423-437.000.

Sugiura, Takeo; Miyajima, Keiji; Nagatomo, Hideo; and Masui, Kiyoshi, to Toppan Printing Co., Ltd. Forgery resistant document with colored areas and method for thwarting reproduction of same. 4,277,514, Cl. 427-1.000.

Sugiyama, Jun-ichi, to Eaton Corporation. Mast and carriage assembly. 4,276,961, Cl. 187-9.00E.

Suling, Carlhans: *See*—
Podszun, Wolfgang; Suling, Carlhans; Walkowiak, Michael; and Schulz, Hans H., 4,277,536, Cl. 428-402.000.

Sulzer Brothers Limited: *See*—
Pfarrwaller, Erwin, 4,276,911, Cl. 139-308.000.
Weber, Max, 4,276,930, Cl. 165-172.000.

Sumitomo Chemical Company, Limited: *See*—
Kataoka, Yushin; Matsuda, Masaaki; and Kamoda, Masaru, 4,277,566, Cl. 521-32.000.
Mitsunaga, Takayoshi; Chinushi, Kiyoto; and Umezu, Tadashi, 4,277,488, Cl. 424-273.00R.

Sumitomo Chemical Industries Ltd.: *See*—
Inamoto, Yoshiaki; Osugi, Motoyoshi; and Kashihara, Eiji, 4,277,473, Cl. 424-248.540.

Sumitomo Electric Industries, Ltd.: *See*—
Okita, Koichi, 4,277,429, Cl. 264-127.000.
Tobioka, Masaaki; Kodama, Mitsuo; Asai, Tsuyoshi; and Yamamoto, Takaharu, 4,277,283, Cl. 75-238.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Yamaguchi, Tetsuo; and Kashiwara, Tomokazu, 4,277,055, Cl. 267-140.000.

Sunbeam Corporation: *See*—
Stahly, Daniel C.; Scott, William H.; and Wagdy, Mohamed K., 4,277,181, Cl. 366-69.000.

Sundkvist, Gustaf J.; Lundgren, Fred O.; Lindberg, Mats-Ove R.; and Bostrom, Erik A., to Boliden Aktiebolag. Apparatus for analysing flowing media. 4,276,777, Cl. 73-864.810.

Sunkyong Fibers, Ltd.: *See*—
Choi, Sam Kwon; and Lee, Kee Dong, 4,277,584, Cl. 525-437.000.

Supertex, Inc.: *See*—
Chao, Robert L., 4,277,782, Cl. 340-661.000.

Surdi, Jean M.: *See*—
Dubois, Claude; and Surdi, Jean M., 4,277,225, Cl. 416-198.00A.

Surprenant, Ronald J., to Lear Siegler, Inc. Automatic gain repeater. 4,277,655, Cl. 179-170.00R.

Susaki, Wataru: *See*—
Tanaka, Toshio; Namizaki, Hirofumi; Takamiya, Saburo; and Susaki, Wataru, 4,277,759, Cl. 331-94.50H.

Susich, Roland J. Drinking cup with laterally actuated valve. 4,276,992, Cl. 220-254.000.

Sussman Bugeltechnik GmbH: *See*—
Jennewein, Manfred A., 4,276,995, Cl. 221-15.000.

Sutton, Roger F.: *See*—
Luck, Allan J.; Clarke, John T.; and Sutton, Roger F., 4,277,428, Cl. 264-118.000.

Suzuki, Akira, to Takagi, Kazusuke, a part interest. Easy-to-assemble lamp. 4,277,823, Cl. 362-352.000.

Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seatbelt system. 4,277,088, Cl. 280-804.000.

Swanson, Michael E.; and Lauderback, Sanford K., to Owens-Corning Fiberglas Corporation. Adhesive composition. 4,277,386, Cl. 260-29.6RW.

Sweeting, Truett B., to Kennecott Corporation. Process for the manufacture of ceramic oxide fibers from solvent solution. 4,277,269, Cl. 65-2.000.

Sweitzer, Gerald M.: *See*—
Carroll, Howard E.; and Sweitzer, Gerald M., 4,277,385, Cl. 260-29.6RW.

Swenson, Robert E. Web supply arrangement. 4,277,033, Cl. 242-67.30R.

Swinehart, Carl F., to Harshaw Chemical Company, The. Getter for melt-grown scintillator ingot and method for growing the ingot. 4,277,303, Cl. 156-616.00R.

Syndrill Carbide Diamond Company: *See*—
Sahley, Lloyd W., 4,277,106, Cl. 299-79.000.

Syntex (U.S.A.) Inc.: *See*—
Vickery, Brian H., 4,277,475, Cl. 424-250.000.
Walker, Keith A. M., 4,277,486, Cl. 424-273.00R.

Synthelabo: *See*—
DuPont, Regis; Lardenois, Patrick; Morel, Claude; Frost, Jonathan; and Koletar, Gabor I., 4,277,476, Cl. 424-250.000.

Syva Company: *See*—
Maggio, Edward T., 4,277,437, Cl. 422-61.000.

Szabo, Bela: *See*—
Takacs, Istvan; Rudolf, Peter; Szabo, Bela; and Kerey, Gyorgy, 4,276,701, Cl. 34-109.000.

Szecsi, Laszlo, to Kernforschungszentrum Karlsruhe GmbH. Device for cooling a superconductive resonator and method of making the device. 4,277,765, Cl. 333-99.00S.

Szonntagh, Eugene L., to Honeywell Inc. Method and apparatus for fluid sample injection for fluid chromatography. 4,276,913, Cl. 141-1.000.

Szulinski, Milton J., to Atlantic Richfield Company. Ventilating system for reprocessing of nuclear fuel rods. 4,277,361, Cl. 422-120.000.

T.J.D. Industries, Ltd.: *See*—
Howard, Thomas, 4,276,929, Cl. 165-145.000.

Tab Products Company: *See*—
Small, Kenneth T., 4,277,692, Cl. 307-66.000.

Tabuchi, Kenji; and Iwata, Hidehito, to Minolta Camera Kabushiki Kaisha. Developing material supplying device. 4,277,003, Cl. 222-350.000.

Tachibana, Seiji: *See*—
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,277,460, Cl. 424-1.000.

Taga Electric Company, Limited: *See*—
Mishiro, Shoji, 4,277,758, Cl. 331-1.00R.

Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, to Tokuyama Soda Kabushiki Kaisha. Alkali calcium silicates and process for preparation thereof. 4,277,457, Cl. 423-331.000.

Taggart, Davis L.: *See*—
Powers, George W., Jr.; Froning, H. Robert; and Taggart, Davis L., 4,277,351, Cl. 252-8.55D.

Takacs, Istvan; Rudolf, Peter; Szabo, Bela; and Kerey, Gyorgy, to Richter Gedeon Vegyeszeti Gyar RT. Apparatus for the drying of wet, pasty and/or fusible materials. 4,276,701, Cl. 34-109.000.

Takada, Shigetaka; Naruse, Kazumichi; and Watanabe, Yukihiro, to Aisan Industry Co., Ltd. Exhaust gas control apparatus. 4,276,745, Cl. 60-276.000.

Takagi, Kazusuke: *See*—
Suzuki, Akira, 4,277,823, Cl. 362-352.000.

Takahashi, Hiromichi, to Pentel Kabushkik Kaisha. Printing and displaying apparatus. 4,277,186, Cl. 400-120.000.

Takahashi, Naoyuki, to Olympus Optical Co., Ltd. Zoom stereomicroscope with taking lens barrel. 4,277,130, Cl. 350-36.000.

Takamiya, Saburo: *See*—
Tanaka, Toshio; Namizaki, Hirofumi; Takamiya, Saburo; and Susaki, Wataru, 4,277,759, Cl. 331-94.50H.

Takanashi, Itsuo: *See*—
Nakagaki, Shintaro; Takanashi, Itsuo; Motoyama, Koichiro; Miyoshi, Tadayoshi; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,277,800, Cl. 358-44.000.

Takeda Chemical Industries, Ltd: *See*—
Fujino, Masahiko; Shinagawa, Susumu; and Kawai, Kiyohisa, 4,277,394, Cl. 260-112.50R.

Takeda, Yoshiteru: *See*—
Fujiwara, Kunihiko; Osawa, Kazuya; Takeda, Yoshiteru; and Yabumoto, Toshiaki, 4,277,572, Cl. 525-61.000.

Takemoto, Iwao: *See*—
Koike, Norio; Takemoto, Iwao; Kubo, Masaharu; Sato, Kazuhiro; and Nagahara, Shusaku, 4,277,799, Cl. 358-44.000.

Takenoya, Hideaki; and Makabe, Hachiro, to Janome Sewing Machine Co., Ltd. Electronic sewing machine with a feed control device. 4,276,840, Cl. 112-315.000.

Takita, Hitoshi: *See*—
Enomoto, Satoru; Wada, Hisayuki; Nishita, Sadao; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,277,633, Cl. 568-879.000.

Talka, Esko T.: *See*—
Forss, Kaj G.; Talka, Esko T.; and Fremer, Kaj-Erik, 4,277,626, Cl. 568-438.000.

Taluba, Anthony P.; and Taluba, Paul A. Apparatus for forming a molded squeeze toy including whistle. 4,277,232, Cl. 425-525.000.

Taluba, Anthony P.; and Taluba, Paul A. Method for forming a molded squeeze toy including whistle. 4,277,300, Cl. 156-244.140.

Taluba, Paul A.: *See*—
Taluba, Anthony P.; and Taluba, Paul A., 4,277,232, Cl. 425-525.000.
Taluba, Anthony P.; and Taluba, Paul A., 4,277,300, Cl. 156-244.140.

Tam, Andrew C.: *See*—
Patel, Chandra K. N.; and Tam, Andrew C., 4,276,780, Cl. 73-643.000.

Tamura, Tooru: *See*—
Yamanaka, Minoru; and Tamura, Tooru, 4,276,746, Cl. 60-290.000.

Tanaka, Toshio; Namizaki, Hirofumi; Takamiya, Saburo; and Susaki, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 4,277,759, Cl. 331-94.50H.
Tanaka, Yasuhiko: *See*—
Fujita, Hisao; Tanaka, Yasuhiko; Kobayashi, Isao; and Nakamura, Ken, 4,276,854, Cl. 118-689.000.
Tani, Tatsuo: *See*—
Ikesue, Masumi; Yano, Takashi; Tatsumi, Susumu; Idenawa, Hiroyuki; Nakamura, Isao; and Tani, Tatsuo, 4,277,163, Cl. 355-14.00R.
Tanno, Takashi; and Koike, Shigemitsu, to Toyo Kogyo Co., Ltd. Method for inspecting gear contact patterns. 4,276,700, Cl. 33-179.50R.
Tate, Jack F.: *See*—
Allen, Joseph C.; and Tate, Jack F., 4,277,580, Cl. 525-383.000.
Tateishi, Tetsuya, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Analyzer for resultant force at joint. 4,277,828, Cl. 364-415.000.
Tatsumi, Susumu; Eda, Tadahiro; and Imai, Chikara, to Ricoh Company, Ltd. Copy image adjustment method. 4,277,549, Cl. 430-30.000.
Tatsumi, Susumu: *See*—
Ikesue, Masumi; Yano, Takashi; Tatsumi, Susumu; Idenawa, Hiroyuki; Nakamura, Isao; and Tani, Tatsuo, 4,277,163, Cl. 355-14.00R.
Taucher, Kenneth F. Multiple stage optical system for creating high-intensity solar light beam. 4,277,129, Cl. 350-27.000.
Taylor, Dennis O.: *See*—
Reid, David L.; and Taylor, Dennis O., 4,277,830, Cl. 364-431.000.
Taylor, John C. Conveyor system for a continuous mining machine. 4,277,105, Cl. 299-64.000.
Taylor, Robert A. Solvent extraction process. 4,277,316, Cl. 203-99.000.
Taylor, Stanford E., to Instructional/Communications Technology, Inc. Controls for synchronizing audio signals with film advancement in a projector. 4,277,152, Cl. 352-17.000.
Teague, Walter D., Jr.; and Sempliner, Arthur T. Power toothbrush or the like with orbital brush action. 4,276,672, Cl. 15-22.00R.
Teche, Andre: *See*—
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Teche, Andre, 4,277,617, Cl. 560-124.000.
Technicon Instruments Corporation: *See*—
Gray, Don N.; and Keyes, Melvin H., 4,277,560, Cl. 435-7.000.
Tekron Licensing B.V.: *See*—
Hickman, Ronald P., 4,276,955, Cl. 182-33.000.
Tektronix, Inc.: *See*—
Hawken, Kenneth W.; and Janko, Bozidar, 4,277,722, Cl. 315-31.00R.
Teledyne Industries, Inc.: *See*—
Barbeau, Dennis E., 4,277,222, Cl. 415-177.000.
Telefonaktiebolaget L M Ericsson: *See*—
Branden, Leif; Bruun, Jan F.; Holm, Olle; Mellgren, Ronnie E.; Ryr, Karl A.; Stromer, Carl-Axel; and Tronslien, Erling, 4,277,652, Cl. 179-100.00D.
Tenneco Chemicals, Inc.: *See*—
Feldman, Martin L.; and De Groff, James T., 4,277,392, Cl. 260-40.00R.
Keyworth, Donald A.; and Purpi, David C., 4,277,567, Cl. 521-56.000.
Tepolt, Florian E.: *See*—
Coman, William E.; and Tepolt, Florian E., 4,276,758, Cl. 64-9.00R.
Termina! Data Corporation: *See*—
Rudy, Michael W.; Horning, Thomas D.; and Kraemer, Edward J., 4,277,190, Cl. 400-582.000.
Teshima, Hiroshi: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.
Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Teche, Andre, 4,277,617, Cl. 560-124.000.
Teuke, Klaus: *See*—
Uhrner, Rudolf; Teuke, Klaus; and Schwarz, Wolfgang, 4,277,734, Cl. 318-758.000.
Texaco Development Corporation: *See*—
Paull, Peter L.; and Child, Edward T., 4,277,365, Cl. 252-373.000.
Texaco Inc.: *See*—
Allen, Joseph C.; and Tate, Jack F., 4,277,580, Cl. 525-383.000.
Allison, Jean B.; Kudchadker, Mohan V.; and Whittington, Lawrence E., 4,277,352, Cl. 252-8.55D.
Calderon, Reynaldo, 4,277,348, Cl. 210-791.000.
Kudchadker, Mohan V.; Kalfoglou, George; and Whittington, Lawrence E., 4,276,933, Cl. 166-266.000.
Ruidisch, Louis E.; and Van Wagenen, Sterling O., 4,277,334, Cl. 210-154.000.
Texas Instruments Incorporated: *See*—
Carlson, George M.; and O'Hagan, Michael, 4,277,827, Cl. 364-200.000.
Hornbeck, Larry J., 4,277,792, Cl. 357-24.000.
Mar, Clarence Y.; and Caruso, Michael J., 4,277,675, Cl. 235-92.0MB.
Ty, Henry, 4,276,754, Cl. 62-187.000.
Textron, Inc.: *See*—
Moertel, George B., 4,276,679, Cl. 24-205.16R.
Moertel, George B., 4,276,680, Cl. 24-205.16R.
Williams, Roy C.; and Rogemoser, David R., 4,277,380, Cl. 260-18.0TN.
Thermo Electron Corporation: *See*—
Rounbehler, David P.; and Potts, Robert S., 4,277,259, Cl. 55-270.000.
Thiele, Horst. Hydraulic damper system. 4.277,086, Cl. 280-709.000.
Thiessen, Reinhardt, Jr: *See*—
Reussner, George H.; and Thiessen, Reinhardt, Jr, 4,277,464, Cl. 424-177.000.
Thomas, Robert J.; Piekarski, Michael; Morgan, Gary B.; Rank, John; Thurman, William O.; and Lerch, Donald C., to Key Tronic Corporation. Document reader. 4,277,689, Cl. 250-567.000.
Thompson, B. Gene. Rotary gravity mixer. 4,277,185, Cl. 366-213.000.
Thompson, David A.: *See*—
Boyd, David C.; and Thompson, David A., 4,277,286, Cl. 106-52.000.
Thompson, David L.: *See*—
McDonald, Ray S.; and Thompson, David L., 4,276,883, Cl. 128-419.0PT.
Thompson, Eric; and Baalham, Christopher J., to Glaxo Group Limited. Preparation of sodium cefuroxime. 4,277,601, Cl. 544-22.000.
Thompson, John S.; and Jadlocki, Joseph F., Jr., to FMC Corporation. Method for inhibiting the growth of clostridium botulinum and the formation of enterotoxin in smoked fish products. 4,277,507, Cl. 426-264.000.
Thompson, John W. Distributor ratchet wrench. 4,276,791, Cl. 81-62.000.
Thomson-CSF: *See*—
Eranian, Armand; Dubois, Jean-Claude; Couttet, Andre; and Datamanti, Evelyne, 4,277,554, Cl. 430-270.000.
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,277,145, Cl. 350-351.000.
Nuzillat, Gerard, 4,277,794, Cl. 357-40.000.
Simonet, William, 4,277,356, Cl. 252-62.590.
Thomson, Morton W., to DBS, Inc. Portable transaction log recorder. 4,276,825, Cl. 101-45.000.
Thornton, Thomas F., to Educational Health Products, Inc. Method of forming dental floss with string and brush portions. 4,277,297, Cl. 156-161.000.
Thorsteinson, Erlind M.: *See*—
Decker, Harry J.; and Thorsteinson, Erlind M., 4,277,375, Cl. 252-455.00R.
Thurman, William O.: *See*—
Thomas, Robert J.; Piekarski, Michael; Morgan, Gary B.; Rank, John; Thurman, William O.; and Lerch, Donald C., 4,277,689, Cl. 250-567.000.
Tickner, Ernest G.; and Rasor, Ned S., to Rasor Associates, Inc. Ultrasonic image enhancement. 4,276,885, Cl. 128-660.000.
Ticks, Gerd-Heinz, to Carl Freudenberg, Firma. Hydraulically damped rubber motor mounting. 4,277,056, Cl. 267-140.100.
TII Industries, Inc.: *See*—
Jones, Raymond D., 4,277,812, Cl. 361-119.000.
Tillmann, Ditmar K.: *See*—
Haworth, Richard G.; Wilson, Harold R.; and Tillmann, Ditmar K., 4,277,123, Cl. 339-22.00R.
Timko, Nicholas, Jr.: *See*—
Dunn, Robert M.; Schulman, Martin D.; and Timko, Nicholas, Jr., 4,277,816, Cl. 361-384.000.
TMC Corporation: *See*—
Himmetsberger, Alois; and Wittmann, Heinz, 4,277,083, Cl. 280-618.000.
Tobioka, Masaaki; Kodama, Mitsuo; Asai, Tsuyoshi; and Yamamoto, Takaharu, to Sumitomo Electric Industries, Ltd. Sintered hard metal and the method for producing the same. 4,277,283, Cl. 75-238.000.
Toda, Shozo: *See*—
Nakayama, Muneo; Nishimura, Toshihiro; Nakane, Hisashi; Toda, Shozo; Hotta, Yoshio; and Minato, Mitsuaki, 4,277,525, Cl. 427-387.000.
Tokuda, Hiroastu; Morinaga, Shigeki; and Nakamura, Hideo, to Hitachi, Ltd. Error preventing device for an electronic engine control apparatus. 4,277,829, Cl. 364-431.000.
Tokunaga, Michio; and Kitano, Junjiro, to Hitachi, Ltd. Semiconductor switch circuit. 4,277,696, Cl. 307-255.000.
Tokuyama Soda Kabushiki Kaisha: *See*—
Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, 4,277,457, Cl. 423-331.000.
Tokyo Denshi Kagaku Kabushiki Kaisha: *See*—
Nakayama, Muneo; Nishimura, Toshihiro; Nakane, Hisashi; Toda, Shozo; Hotta, Yoshio; and Minato, Mitsuaki, 4,277,525, Cl. 427-387.000.
Tokyo Kogaku Kakai Kabushiki Kaisha: *See*—
Iwafune, Yasuo; and Iwai, Hideo, 4,277,171, Cl. 356-153.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Wada, Shinzi; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, 4,277,150, Cl. 351-13.000.
Tokyo Koso Kabushiki Kaisha: *See*—
Zinnai, Sadazi, 4,277,047, Cl. 251-362.000.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See*—
Nakayama, Muneo; Nishimura, Toshihiro; Nakane, Hisashi; Toda, Shozo; Hotta, Yoshio; and Minato, Mitsuaki, 4,277,525, Cl. 427-387.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Horiike, Yasuhiro; Okano, Haruo; Shibagaki, Masahiro; and Kadono, Katsuo, 4,277,304, Cl. 156-643.000.
Yamada, Yoshihiro, 4,277,160, Cl. 355-3.00R.
Tokyo Shibaura Electric Company, Limited: *See*—
Sato, Kozo, 4,277,811, Cl. 361-101.000.

Tolman, Richard L.; Ashton, Wallace T.; and Brown, Ronald D., to Merck & Co., Inc. Preparation of 5-deazariboflavins. 4,277,603, Cl. 544-250.000.

Tomic, Dobrivoje. Remedy producing hemostatic and antiphlogistic effects. 4,277,463, Cl. 424-128.000.

Toppan Printing Co., Ltd.: *See—*
Sugiura, Takeo; Miyajima, Keiji; Nagatomo, Hideo; and Masui, Kiyoshi, 4,277,514, Cl. 427-1.000.

Toray Industries, Inc.: *See—*
Kanamaru, Naokatu; Imai, Kazuo; and Fujino, Hisaaki, 4,277,340, Cl. 210-433.200.

Torby, Arne, to Saab-Scania AB. Direction determining apparatus responsive to electromagnetic radiation. 4,277,788, Cl. 343-113.00R.

Torre, Giancarlo D., to Rockwell-Rimoldi, S.p.A. Device for regulating the transport mechanism in sewing machines. 4,276,842, Cl. 112-322.000.

Toyo Kogyo Co., Ltd.: *See—*
Tanno, Takashi; and Koike, Shigemitsu, 4,276,700, Cl. 33-179.50R.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Saito, Toshihiro; Tsutsumi, Yukihiro; Arai, Shoji; and Matsunaga, Hideaki, 4,277,414, Cl. 260-429.00R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,277,088, Cl. 280-804.000.

Trane Company, The: *See—*
Foust, Harry D., 4,276,927, Cl. 165-70.000.

Traub, Stefan, to Hewlett-Packard Company. Input circuit for electronic instruments. 4,277,749, Cl. 324-126.000.

Treadwell, Archie B.: *See—*
Blanning, Robert B.; Treadwell, Archie B.; and Logie, James A., 4,277,039, Cl. 244-3.160.

Tremco, Inc.: *See—*
Kumins, Charles A.; and Warford, Milan L., 4,277,533, Cl. 428-332.000.

Trepalin, Anatoly I.: *See—*
Barsukov, Vyacheslav Z.; Dunovsky, Sergei A.; Sagoian, Lenik N.; Trepalin, Anatoly I.; Aguf, Igor A.; and Smolkova, Valentina S., 4,277,546, Cl. 429-59.000.

Tri-State Oil Tool Industries, Inc.: *See—*
Murray, William K., 4,276,931, Cl. 166-99.000.

Trio Kabushiki Kaisha: *See—*
Wada, Takeshi; Ienaka, Masanori; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,277,703, Cl. 307-553.000.

Trohatos, George: *See—*
Nally, Robert B.; Akister, James F.; and Trohatos, George, 4,277,775, Cl. 340-146.30Q.

Tronslien, Erling: *See—*
Branden, Leif; Bruun, Jan F.; Holm, Olle; Mellgren, Ronnie E.; Ryr, Karl A.; Stromer, Carl-Axel; and Tronslien, Erling, 4,277,652, Cl. 179-100.00D.

Tropel, Inc.: *See—*
Kleiber, Joseph P., 4,277,141, Cl. 350-299.000.

Trouet, Andre, to Institut International de Pathologie Cellulaire et Moleculaire. Complexes of DNA and esters derived from daunorubicine, their preparation and use. 4,277,466, Cl. 424-180.000.

Trutzschler GmbH & Co. KG.: *See—*
Piske, Wolfgang, 4,276,677, Cl. 19-102.000.

TRW Inc.: *See—*
Brookes, Ronald R., 4,276,922, Cl. 164-27.000.
Dymond, Richard W., 4,276,812, Cl. 91-467.000.

Tsuchiya, Takuzo: *See—*
Rasmussen, Glenn; Huston, Larry; Morse, Donald W.; Tsuchiya, Takuzo; Morrison, Clifton H.; Rustad, Stanley C.; and Eiden, Leo, 4,276,795, Cl. 83-42.000.

Tsuji, Keiji: *See—*
Fujii, Kiyoshi; Tsuji, Keiji; and Nishimoto, Seiya, 4,277,774, Cl. 340-146.30Q.

Tsujii, Kaoru; Saito, Naoyuki; and Kawai, Michio, to Kao Soap Co., Ltd. Detergent compositions containing partially neutralized alkyl or alkenyl succinic acid. 4,277,378, Cl. 252-546.000.

Tsukada, Takami; Akutsu, Masao; and Saito, Tadao, to Yoshino Kogyosho Co., Ltd. Bottle made of saturated polyester resin. 4,276,986, Cl. 215-1.00C.

Tsuneta, Kazuyoshi: *See—*
Hayashi, Masaaki; Nagami, Koichi; Tsuneta, Kazuyoshi; and Kenmotusu, Nobuhiro, 4,277,383, Cl. 260-29.300.

Tsushima, Shoichiro: *See—*
Sakakibara, Shumpei; Kumahara, Yuichi; Okada, Yoshiaki; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tsushima, Shoichiro, 4,277,393, Cl. 260-112.50R.

Tsutsumi, Yukihiro: *See—*
Saito, Toshihiro; Tsutsumi, Yukihiro; Arai, Shoji; and Matsunaga, Hideaki, 4,277,414, Cl. 260-429.00R.

Tulen, Jack A.; and Tulen, James L. Replacement spoons & fixtures for rotary hoe. 4,276,686, Cl. 29-270.000.

Tulen, James L.: *See—*
Tulen, Jack A.; and Tulen, James L., 4,276,686, Cl. 29-270.000.

Tuley, Bertha L. Wind propelled fan. 4,276,816, Cl. 98-23.000.

Tupper, David E.: *See—*
Horwell, David C.; and Tupper, David E., 4,277,480, Cl. 424-258.000.

Tupper, George L., to Coral Chemical Company. Ternary corrosion resistant coatings. 4,277,292, Cl. 148-6.270.

Turcke, Rainer: *See—*
Nagel, Erich; Turcke, Rainer; and Ludemann, Heinz, 4,277,061, Cl. 271-302.000.

Turley, Bernard C.; and Hochbein, David E., to Aluminum Company of America. Safety hook device. 4,277,093, Cl. 294-83.00R.

Turner, Henry H. Method and device for control of translocation in a stem. 4,276,721, Cl. 47-58.000.

Turner, Nelson R.; Sanders, Daniel E.; and Bienenstein, Charles A., to Model A and Model T Motor Car Reproduction Corporation, The. Vehicle rear leaf spring support. 4,277,087, Cl. 280-718.000.

Ty, Henry, to Texas Instruments Incorporated. Refrigerator control and system. 4,276,754, Cl. 62-187.000.

Tyler Refrigeration Corporation: *See—*
Perez, Arthur; and Abraham, Fayez F., 4,276,755, Cl. 62-196.00B.

Uchida, Shinya, to Laurel Bank Machine Co., Ltd. Cover for counting zone in note counter. 4,277,119, Cl. 312-208.000.

Uhner, Rudolf; Teuke, Klaus; and Schwarz, Wolfgang, to R. Stahl GmbH & Co. Electric brake motor. 4,277,734, Cl. 318-758.000.

Ukihashi, Hiroshi; Yamabe, Masaaki; and Kojima, Hiroaki, to Asahi Glass Company, Ltd. Process for preparing a propylene-tetrafluoroethylene copolymer. 4,277,586, Cl. 526-93.000.

Ulmer, Harry E.: *See—*
Gupton, B. Frank; and Ulmer, Harry E., 4,277,620, Cl. 562-609.000.

Umezu, Tadashi: *See—*
Mitsunaga, Takayoshi; Chinushi, Kiyoto; and Umezu, Tadashi, 4,277,488, Cl. 424-273.00R.

Unicler: *See—*
Fromantin, Jean-Pierre M. J., 4,277,497, Cl. 424-316.000.

Unikat AB: *See—*
Hergart, P. Anders, 4,277,442, Cl. 422-119.000.

Union Carbide Corporation: *See—*
Bryant, David R.; and Billig, Ernst, 4,277,627, Cl. 568-454.000.
Decker, Harry J.; and Thorsteinson, Erlind M., 4,277,375, Cl. 252-455.00R.
Ginsberg, Thomas; and Kaufman, Lawrence G., 4,277,284, Cl. 106-1.050.
Kalnoki-Kis, Tibor, 4,277,545, Cl. 429-48.000.
Mago, Blake F., 4,277,366, Cl. 252-392.000.
Matlock, Paul L.; and Sandner, Michael R., 4,277,318, Cl. 204-78.000.
Mellors, Geoffrey W.; and Sheffield, Glenn W., 4,277,360, Cl. 252-182.100.
Walker, Wellington E., 4,277,634, Cl. 568-902.000.

United Centrifugal Pumps: *See—*
Murray, John T., 4,277,210, Cl. 409-191.000.

United States of America
Agriculture: *See—*
Johnson, Donovan E., 4,277,564, Cl. 435-242.000.
Rowland, Stanley P., 4,277,243, Cl. 8-183.000.
Shasha, Baruch S.; Doane, William M.; and Russell, Charles R., 4,277,364, Cl. 252-316.000.

Army: *See—*
Abell, William R., 4,277,201, Cl. 404-35.000.
Bruce, Charles W., 4,277,179, Cl. 356-433.000.
Drzewiecki, Tadeusz M., 4,276,895, Cl. 137-2.000.
Holmes, Allen B., 4,276,943, Cl. 175-40.000.
Morgan, Robert L.; Cupitt, Larry T.; and Gamble, William L., 4,277,146, Cl. 350-356.000.
Smith, James L.; and Christensen, Charles R., 4,277,127, Cl. 350-3.670.
Sobota, Valentine M.; and Vinson, Marshall, 4,277,819, Cl. 362-80.000.
Upatnieks, Juris; Christensen, Charles R.; and Guenther, Bobby D., 4,277,137, Cl. 350-162.0SF.
Yates, Robert E.; Leonard, John P.; Alongi, Robert E.; Albanes, Wilfredo V.; and Bishop, Charles M., 4,277,038, Cl. 244-3.150.

Energy: *See—*
Bohachevsky, Ihor O., 4,277,305, Cl. 176-1.000.
Jackson, Kenneth M., 4,276,904, Cl. 137-599.000.
Rusch, Gordon K.; Keefe, Donald J.; and McDowell, William P., 4,277,308, Cl. 176-19.0EC.

Environmental Protection Agency: *See—*
Hart, W. Howard; and Weber, Helmut E., 4,277,131, Cl. 350-63.000.

Health and Human Services: *See—*
Dauben, William G.; Baskin, Craig P.; and vanRiel, Herman C. H. A., 4,277,604, Cl. 546-44.000.

Health, Education and Welfare: *See—*
Leighton, Stephen B., 4,277,017, Cl. 233-25.000.

National Aeronautics and Space Administration; administrator; with respect to an invention of:
Poshkus, Algirdas C. Synthesis of polyformals. 4,277,402, Cl. 260-340.90R.

National Aeronautics and Space Administration: *See—*
Kosmahl, Henry G., 4,277,721, Cl. 315-5.380.

Navy: *See—*
Amy, J. A.; and Huber, Harvard C., 4,277,368, Cl. 252-408.000.
Dusheck, George J., Jr., 4,277,700, Cl. 307-273.000.
Eppel, Joseph C., 4,277,167, Cl. 356-5.000.
McKinney, James A., 4,277,839, Cl. 367-155.000.
Reed, Russell, Jr.; Moore, Kenneth L.; and Meyers, Gary W., 4,277,203, Cl. 405-264.000.
Skaalen, Clifford I., 4,276,958, Cl. 182-135.000.

U.S. Philips Corporation: *See—*
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., 4,277,542, Cl. 338-308.000.
Carson, Arthur N., 4,277,684, Cl. 250-445.00T.
Claassens, Jacobus M. M.; van der Leeuw, Bart; and van Elderen, Nicolaas F., 4,277,715, Cl. 313-220.000.

Couwenberg, Winston D.; Bouwknegt, Albert; Ligthart, Franciscus A. S.; and Heuvelmans, Jean J., 4,277,720, Cl. 313-485.000.
Dammann, Hans, 4,277,138, Cl. 350-162.00R.
Duquenne, Michel G. A.; David, Guy A. J.; Grima, Jean-Claude; and Daguet, Jacques L., 4,277,843, Cl. 370-84.000.
Harding, Geoffrey, 4,277,686, Cl. 250-445.00T.
Hasker, Jan; Vervest, Johannes C. G.; Peters, Cornelis; and Vroomen, Laurentius C. J., 4,277,713, Cl. 313-203.000.
Leitner, Harald, 4,276,781, Cl. 73-647.000.
Penning, Cornelis, 4,277,654, Cl. 179-156.00R.
Rehfeldt, Karl H., 4,277,795, Cl. 358-8.000.
Sneijers, Andreas P. E., 4,277,725, Cl. 315-73.000.
Van Benthem, Willem; and De Vaan, Robertus L. C., 4,277,717, Cl. 313-226.000.

United States Steel Corporation: *See—*
Aiken, John E.; and Didycz, William J., 4,277,453, Cl. 423-247.000.
McKenna, James F.; and Anderson, Douglas O., 4,277,312, Cl. 202-241.000.

United Technologies Corporation: *See—*
Eckbreth, Alan C., 4,277,760, Cl. 331-94.50N.

Uozumi, Norihira: *See—*
Abe, Kozin; Uozumi, Norihira; and Oishi, Kazuaki, 4,277,746, Cl. 324-72.000.

Upatnieks, Juris; Christensen, Charles R.; and Guenther, Bobby D., to United States of America, Army. Coherent optical correlator. 4,277,137, Cl. 350-162.0SF.

Upjohn Company, The: *See—*
Bundy, Gordon L., 4,277,612, Cl. 560-55.000.
Sih, John C., 4,277,611, Cl. 560-53.000.
Sih, John C., 4,277,613, Cl. 560-121.000.
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Sih, John C., 4,277,616, Cl. 560-121.000.
Sih, John C., 4,277,619, Cl. 562-465.000.

Upton, Robert W., Jr., to Honeywell Inc. Fiber optic loop signal coupler apparatus. 4,277,134, Cl. 350-96.200.

Ura, Masaaki: *See—*
Yoshimoto, Takeo; Igarashi, Keiichi; Oda, Kengo; Ura, Masaaki; and Sato, Naoki, 4,277,624, Cl. 568-44.000.

Ura, Mitsugu, to Hitachi, Ltd. Deflection yoke. 4,277,767, Cl. 335-210.000.

Urbanek, Karel; and Bleiweiss, Arthur F., to Dominion Auto Accessories Limited. Combined headlight, turn signal and parking lamp for snow plows and the like. 4,277,818, Cl. 362-61.000.

Urick, Palmer D.; and Bienz, Robert H., to General Electric Company. Apparatus and method for axial insertion of dynamoelectric machine end turn insulation. 4,276,689, Cl. 29-596.000.

Urosevich, Miroslav, to Alpha Solarco Inc. Reflectors for solar energy collectors. 4,276,873, Cl. 126-438.000.

Usardi, Maria M.: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,277,491, Cl. 424-285.000.

Ustinov, deceased Viktor I.: *See—*
Kozhevnikov, Vladislav A.; Kononov, Ivan V.; Maslennikov, Ivan E.; Platonov, Vladimir N.; Kharitonovich, Mikhail V.; Ustinov, deceased Viktor I.; and Ustinov, Klavdia G., administrator, 4,276,764, Cl. 72-275.000.

Ustinov, Klavdia G., administrator: *See—*
Kozhevnikov, Vladislav A.; Kononov, Ivan V.; Maslennikov, Ivan E.; Platonov, Vladimir N.; Kharitonovich, Mikhail V.; Ustinov, deceased Viktor I.; and Ustinov, Klavdia G., administrator, 4,276,764, Cl. 72-275.000.

Valencia, C. Estaban. Apparatus to aid in the docking and mooring of a boat. 4,276,850, Cl. 114-230.000.

Valmont Industries, Inc.: *See—*
Olson, Dale E., 4,277,028, Cl. 239-184.000.
Sherwin, Owen W., 4,277,027, Cl. 239-177.000.

Van Products Company: *See—*
Richardson, Mason E., 4,276,694, Cl. 33-126.70R.

Van Benthem, Willem; and De Vaan, Robertus L. C., to U.S. Philips Corporation. Low-pressure sodium vapor discharge lamp. 4,277,717, Cl. 313-226.000.

van Boven, Petrus L. M.; and Winthaegen, Leon M. W., to Oce-Nederland B.V. Exposure device. 4,277,166, Cl. 355-67.000.

VanBuren, Martin F.: *See—*
Deichert, William G.; Niu, Gregory C.; and VanBuren, Martin F., 4,277,595, Cl. 528-26.000.

Vance, John M., to Haris, J. Wylie, Jr. Power assisted pedicycle. 4,276,950, Cl. 180-7.00P.

van der Kruijs, Franciscus N. G. R.: *See—*
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., 4,277,542, Cl. 338-308.000.

van der Leeuw, Bart: *See—*
Claassens, Jacobus M. M.; van der Leeuw, Bart; and van Elderen, Nicolaas F., 4,277,715, Cl. 313-220.000.

VanderNeut, Richard D.: *See—*
Cushing, Charles J.; Phillips, Clifton W.; and VanderNeut, Richard D., 4,277,178, Cl. 356-431.000.

Van der Smissen, Carl-Ernst; and Pantaleon-Stemberg, Gerd, to Dragerwerk Aktiengesellschaft. Air purifying cartridges for respirators. 4,277,443, Cl. 422-122.000.

Vandoni, Guido, to Resfar S.r.l. 1(p-Chlorobenzoyl)-5-methoxy-2-methyl indole-3-acetic acid-3-oxo-isobenzofuranyl ester and pharmaceutical use thereof. 4,277,489, Cl. 424-274.000.

van Elderen, Nicolaas F.: *See—*
Claassens, Jacobus M. M.; van der Leeuw, Bart; and van Elderen, Nicolaas F., 4,277,715, Cl. 313-220.000.

Van Gompel, James J., to Brammall, Inc. Manually operated adjustable retainer. 4,277,211, Cl. 410-47.000.

van Kattenbroek, Hendrik J., to Moba Holding Barneveld B.V. Distribution and conveyor apparatus for eggs. 4,276,977, Cl. 198-446.000.

Van Landeghem, Hugo, to Institut Francais du Petrole. Apparatus for converting hydrocarbons. 4,277,444, Cl. 422-191.000.

Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, to L'Oreal. Polyamino-polyamide crosslinked with crosslinking agent. 4,277,581, Cl. 525-420.000.

Van Malderghem, Edmund G.: *See—*
Wakeman, William R.; Van Malderghem, Edmund G.; and Greulich, Kenneth R., 4,277,016, Cl. 229-69.000.

van Nederveen, Hans B., to SKF Industrial Trading & Development Co. B.V. Process for the manufacture of a drill head provided with hard, wear-resistant elements. 4,276,788, Cl. 76-108.00A.

Van Peteghem, Antoine: *See—*
De Schepper, Achille; and Van Peteghem, Antoine, 4,277,445, Cl. 422-259.000.

vanRiel, Herman C. H. A.: *See—*
Dauben, William G.; Baskin, Craig P.; and vanRiel, Herman C. H. A., 4,277,604, Cl. 546-44.000.

Van Wagenen, Sterling O.: *See—*
Ruidisch, Louis E.; and Van Wagenen, Sterling O., 4,277,334, Cl. 210-154.000.

Varian Associates, Inc.: *See—*
Shrader, Merrald B., 4,277,718, Cl. 313-304.000.

Varma, Vijaya K., to Exxon Research & Engineering Co. Hydrocarbon soluble sulfonated polyols, esters of hydrocarbon substituted C_4-C_{10} dicarboxylic acids with polyols and sulfonic acid, processes therefor, and lubricating compositions thereof. 4,277,417, Cl. 260-456.00R.

Vasquez, Ray M., to Motorola, Inc. Delay type flip-flop. 4,277,698, Cl. 307-272.00A.

Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
Johne, Hans; Jentzsch, Arndt; Schmidt, Lothar; Muller, Wolfgang; and Funke, Mandred, 4,276,827, Cl. 101-212.000.

Vedder, James L., to Mead Corporation, The. Method of producing a charge plate for use in an ink recorder. 4,277,548, Cl. 430-22.000.

Verhecken, Andre: *See—*
Jaeken, Jan; and Verhecken, Andre, 4,277,559, Cl. 430-549.000.

Vervest, Johannes C. G.: *See—*
Hasker, Jan; Vervest, Johannes C. G.; Peters, Cornelis; and Vroomen, Laurentius C. J., 4,277,713, Cl. 313-203.000.

Verzwyvelt, Scott A., to Hughes Aircraft Company. Alkaline battery spearator. 4,277,547, Cl. 429-251.000.

Vesperman, William C.: *See—*
Piper, George F.; Vesperman, William C.; and Wilson, Max K., 4,277,642, Cl. 174-117.00F.

Vesta, Inc.: *See—*
Woinowski, Willis E., 4,277,432, Cl. 264-173.000.

Vickery, Brian H., to Syntex (U.S.A.) Inc. Contraceptive methods employing 1-substituted imidazole derivatives. 4,277,475, Cl. 424-250.000.

Victor Company of Japan, Ltd.: *See—*
Nakagaki, Shintaro; Takanashi, Itsuo; Motoyama, Koichiro; Miyoshi, Tadayoshi; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,277,800, Cl. 358-44.000.

Viennet, Rene: *See—*
Saurer, Eric; Gharadjedaghi, Fereydoun; Laesser, Claude; Viennet, Rene; and Ruedin, Yves, 4,277,144, Cl. 350-349.000.

Viers, Homer J., to General Motors Corporation. Supple exhaust coupling. 4,277,092, Cl. 285-263.000.

Vietzke, Horst: *See—*
Bregulla, Eduard; Chrubasik, Alfred; and Vietzke, Horst, 4,276,834, Cl. 110-237.000.

Vignaud, Jean C., to La Telemecanique Electrique. Switch push button lock. 4,277,666, Cl. 200-328.000.

Vigouret, Jean-Marie, to Sandoz Ltd. Organic compounds. 4,277,481, Cl. 424-261.000.

Vineland Laboratories, Inc.: *See—*
Yiournas, Costas, 4,276,879, Cl. 128-218.00A.

Vinson, Marshall: *See—*
Sobota, Valentine M.; and Vinson, Marshall, 4,277,819, Cl. 362-80.000.

Virginia Chemicals Inc.: *See—*
Gupton, B. Frank; and Ulmer, Harry E., 4,277,620, Cl. 562-609.000.

Vitale, Alexander F.: *See—*
Howard, Robert; Robinson, Prentice; and Vitale, Alexander F., 4,277,189, Cl. 400-320.000.

Vobel, Wilhelm: *See—*
Stuwe, Botho; and Vobel, Wilhelm, 4,277,115, Cl. 308-26.000.

Voege, Herbert: *See—*
Dorn, Hubert; and Voege, Herbert, 4,277,467, Cl. 424-217.000.

Voest-Alpine Aktiengesellschaft: *See—*
Haslmayr, Johann, 4,277,235, Cl. 432-18.000.

Vogel, Ignaz. Vehicle seat support. 4,277,101, Cl. 297-232.000.

Voigt, Armin: *See—*
Jager, Gerhard; von Konig, Anita; Liebe, Werner; and Voigt, Armin, 4,277,557, Cl. 430-446.000.

Voith Getriebe KG: *See—*
Herrmann, Berthold; and Lindenthal, Hans, 4,276,970, Cl. 188-296.000.

Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, to BASF Aktiengesellschaft. Isolation of a conjugated diolefin from a C_4- or C_5-hydrocarbon mixture. 4,277,315, Cl. 203-51.000.

Volkamer, Klaus: *See*—
Lindner, Alfred; Volkamer, Klaus; and Wagner, Ulrich, 4,277,314, Cl. 203-50.000.

Von ROLL AG: *See*—
Zeltner, Erich, 4,276,835, Cl. 110-342.000.

von Konig, Anita: *See*—
Jager, Gerhard; von Konig, Anita; Liebe, Werner; and Voigt, Armin, 4,277,557, Cl. 430-446.000.

von Renteln, Adrian: *See*—
Jorendal, Gunnar; and von Renteln, Adrian, 4,277,770, Cl. 336-60.000.

Vopel, Karl-Heinz: *See*—
Berendes, Otto; and Vopel, Karl-Heinz, 4,277,459, Cl. 423-567.00A.

Voss, Peter, to Siemens Aktiengesellschaft. Method of restoring Si crystal lattice order after neutron irradiation. 4,277,307, Cl. 176-10.000.

Voss, Richard J., to General Motors Corporation. Generator voltage regulator. 4,277,738, Cl. 322-28.000.

Vroomen, Laurentius C. J.: *See*—
Hasker, Jan; Vervest, Johannes C. G.; Peters, Cornelis; and Vroomen, Laurentius C. J., 4,277,713, Cl. 313-203.000.

VTI, Inc.: *See*—
Silva, Robert M.; and Orazio, Fred D., Jr., 4,277,761, Cl. 331-94.50T.

W. Schlafhorst and Co.: *See*—
Raasch, Hans; and Grecksch, Hans, 4,276,742, Cl. 57-263.000.

W. & T. Avery Limited: *See*—
Ferguson, Andrew C., 4,276,772, Cl. 73-862.620.

Wada, Hisayuki: *See*—
Enomoto, Satoru; Wada, Hisayuki; Nishita, Sadao; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,277,633, Cl. 568-879.000.

Wada, Kenichi; Murasaki, Hiroshi; Enoguchi, Yuji; and Fujiwara, Takao, to Minolta Camera Kabushiki Kaisha. Photocopying machine equipped with variable magnification arrangement. 4,277,165, Cl. 355-55.000.

Wada, Shinzi; Kitao, Ikuo; Kato, Yasuo; and Ishihara, Taketoshi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Eye refractmeter. 4,277,150, Cl. 351-13.000.

Wada, Takeshi; Ienaka, Masanori; Miyamoto, Yukihiko; and Yamada, Tsuneo, to Hitachi, Ltd.; and Trio Kabushiki Kaisha. Monostable multivibrator circuit with clamped non-saturating common emitter amplifier in feedback path. 4,277,703, Cl. 307-553.000.

Waddington, Clive, to Avco Corporation. Stepless, variable stroke drive having a non-rotating cam. 4,276,784, Cl. 74-336.00R.

Wagdy, Mohamed K.: *See*—
Stahly, Daniel C.; Scott, William H.; and Wagdy, Mohamed K., 4,277,181, Cl. 366-69.000.

Wagener, Klaus: *See*—
Heitkamp, Dieter; and Wagener, Klaus, 4,277,345, Cl. 210-679.000.

Wagner, Ulrich: *See*—
Lindner, Alfred; Volkamer, Klaus; and Wagner, Ulrich, 4,277,314, Cl. 203-50.000.
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,277,315, Cl. 203-51.000.

Wahl, Edward F., III; and Boucher, Frederic B., to Occidental Petroleum Corporation. Recovery of energy from geothermal brine and other hot water sources. 4,276,748, Cl. 60-641.00D.

Wahle, Gunter; and Heitmann, Uwe, to Hauni-Werke Korber & Co Kg. Method and apparatus for testing cigarettes or the like. 4,277,678, Cl. 250-223.00R.

Waitkus, Phillip A.; and Lepeska, Bohumir, to Plastics Engineering Company. Oxirane polyimide copolymers. 4,277,583, Cl. 525-423.000.

Wakabayashi, Ataru; and Masuhara, Isao, to Chiyoda Chemical Engineering & Construction Co., Ltd. Wet process for the desulfurization of exhaust gas. 4,277,451, Cl. 423-243.000.

Wakeman, William R.; Van Malderghem, Edmund G.; and Greulich, Kenneth R., to Moore Business Forms. Envelope assembly. 4,277,016, Cl. 229-69.000.

Waldron, Wesley K., to General Electric Company. Multi-electrode liquid crystal displays. 4,277,786, Cl. 340-765.000.

Walker, Benjamin M., to Sentinel Foam Products Incorporated. Fire-retardant foam. 4,277,569, Cl. 521-92.000.

Walker, Keith A. M., to Syntex (U.S.A.) Inc. 1-[(Substituted-naphthyl-)ethyl]-imidazole derivatives. 4,277,486, Cl. 424-273.00R.

Walker, Wellington E., to Union Carbide Corporation. Process for the selective homologation of methanol to ethanol. 4,277,634, Cl. 568-902.000.

Walkowiak, Michael: *See*—
Podszun, Wolfgang; Suling, Carlhans; Walkowiak, Michael; and Schulz, Hans H., 4,277,536, Cl. 428-402.000.

Wallace, Duane W., to Reed Tool Company. Hard surfacing for oil well tools. 4,277,108, Cl. 308-4.00A.

Wallis, Craig: *See*—
Melnick, Joseph L.; and Wallis, Craig, 4,277,250, Cl. 23-230.00B.

Walls, Robert R.: *See*—
Schillke, Peter; and Walls, Robert R., 4,277,518, Cl. 427-96.000.

Walser, Reimund A.: *See*—
Holan, George; and Walser, Reimund A., 4,277,490, Cl. 424-282.000.

Walter, Karl H.; Johnston, John D.; and Wetherley, Dennis, to Adelaide & Wallaroo Fertilizers Ltd. Granulating an aqueous dispersion of ammonium and potassium salts. 4,277,253, Cl. 23-313.00R.

Walters, Kenneth I. Enclosure doors. 4,276,919, Cl. 160-206.000.

Walther, Ronald G.: *See*—
Brown, David J.; Walther, Ronald G.; Williams, Thomas W.; and Wrigglesworth, Michael D., 4,277,699, Cl. 307-272.00R.

Wanner, Karl; Lehmann, Werner; and Ranger, Ulrich, to Robert Bosch GmbH. Hand-held power tool. 4,276,941, Cl. 173-117.000.

Ward, Bobby N., Sr. Mud return line connector apparatus. 4,276,945, Cl. 175-209.000.

Ward, William H., Jr. Non-linear predistortion linearizing circuit for a varactor diode tuned oscillator. 4,277,763, Cl. 331-96.000.

Warford, Milan L.: *See*—
Kumins, Charles A.; and Warford, Milan L., 4,277,533, Cl. 428-332.000.

Warnant, Julien; and Jolly, Jean, to Roussel Uclaf. Preparation of 9α-fluoro-16α-methyl-21-acetoxy-$\Delta^{1,4}$-pregnadiene-11β-ol-3,20-dione. 4,277,409, Cl. 260-397.450.

Warner & Swasey Company, The: *See*—
Fournier, Roger H., 4,276,723, Cl. 51-238.00S.

Waschkuttis, Gerhard. Fuel-vaporizing system for internal-combustion engine and method of operating same. 4,276,864, Cl. 123-544.000.

Watanabe, Yoshiaki: *See*—
Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, 4,277,457, Cl. 423-331.000.

Watanabe, Yukihiro: *See*—
Takada, Shigetaka; Naruse, Kazumichi; and Watanabe, Yukihiro, 4,276,745, Cl. 60-276.000.

Webb, David; and Mills, Anthony J., to Bush Boake Allen Limited. Perfume compositions containing dimethyl heptenonitriles. 4,277,377, Cl. 252-522.00R.

Webb, Paul D.; Kiefer, William J.; and Aumick, James M., to Ingersoll-Rand Company. Oil distributing means. 4,276,960, Cl. 184-6.220.

Webb, Paul P., to RCA Corporation. Photodiode having enhanced long wavelength response. 4,277,793, Cl. 357-30.000.

Weber, Franz K.; and Reed, Martin R. Knockdown shade assembly for lighting fixture. 4,277,822, Cl. 362-352.000.

Weber, Helmut E.: *See*—
Hart, W. Howard; and Weber, Helmut E., 4,277,131, Cl. 350-63.000.

Weber, John G.; and Chia, E. Henry, to Southwire Company. Continuous filter for molten copper. 4,277,281, Cl. 75-93.00R.

Weber, Max, to Sulzer Brothers Limited. Tube nest for a heat exchanger. 4,276,930, Cl. 165-172.000.

Webinger, George, to Champion International Corporation. Air freshener. 4,277,014, Cl. 229-11.000.

Wehrli, Rudolf: *See*—
Farooq, Saleem; Ackermann, Peter; Drabek, Jozef; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,277,494, Cl. 424-305.000.

Weik, Kirby B., to Koehler-Dayton, Inc. Locking assembly for aircraft seat. 4,277,043, Cl. 248-503.100.

Weik, Kirby B., to Koehler-Dayton, Inc. Aircraft seat with pelvic pad. 4,277,103, Cl. 297-457.000.

Weisz, William, to Singer Company, The. Stitch length and feed reversing control for a sewing machine. 4,276,841, Cl. 112-317.000.

Weitz, Hans-Martin: *See*—
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,277,315, Cl. 203-51.000.

Welch, Melvin B.: *See*—
McDaniel, Max P.; and Welch, Melvin B., 4,277,587, Cl. 526-106.000.

Welch, Willard M., Jr., to Pfizer Inc. 5-(4-Fluorophenyl)tetrahydro-2-furanol. 4,277,404, Cl. 260-347.800.

Wellons, Edwin L.: *See*—
Hurt, Frank K.; and Wellons, Edwin L., 4,276,981, Cl. 198-866.000.

Weresch, Thomas. Apparatus for cutting to length the connecting wires of electrical components. 4,276,796, Cl. 83-167.000.

Wesch, William E., Jr. Hydrostatic testing apparatus. 4,276,771, Cl. 73-49.800.

Wesenberg, Kenneth L.: *See*—
Mahle, Howard C.; and Wesenberg, Kenneth L., 4,277,214, Cl. 414-139.000.

Western Electric Company, Inc.: *See*—
Piper, George F.; Vesperman, William C.; and Wilson, Max K., 4,277,642, Cl. 174-117.00F.
Sams, Terry L., 4,277,646, Cl. 179-2.0DP.

Western Publishing Company: *See*—
Staehle, Dale O., 4,277,133, Cl. 350-90.000.

Westinghouse Electric Corp.: *See*—
Dent, Thomas H.; Jordan, Diane E.; King, William E.; and Rieger, Frank W., 4,276,856, Cl. 122-382.000.
Johnson, Frederick O., 4,277,825, Cl. 363-87.000.
Maier, Alfred E.; and Ricci, Louis N., 4,277,664, Cl. 200-293.000.
McNab, Ian R.; and Reichner, Philip, 4,277,708, Cl. 310-228.000.
Munson, William A., 4,277,733, Cl. 318-732.000.
Riggins, Oral L., 4,277,719, Cl. 313-325.000.
Skroupa, James D., 4,277,815, Cl. 361-383.000.

Weston, David, to Reynolds Metals Company. Removal of iron and titanium minerals from aluminum bearing materials by chlorination and beneficiation. 4,277,446, Cl. 423-136.000.

Wetherley, Dennis: *See*—
Walter, Karl H.; Johnston, John D.; and Wetherley, Dennis, 4,277,253, Cl. 23-313.00R.

Wetzelsberger, Nikolaus: *See*—
Lucker, Peter W.; and Wetzelsberger, Nikolaus, 4,277,461, Cl. 424-44.000.

Weyman, Henry W. Pneumatic cylinder assemblies. 4,276,813, Cl. 92-12.000.

Wheelabrator Corporation of Canada Limited: *See*—
Dick, Gordon A., 4,277,266, Cl. 55-381.000.

White, William D. Golf game and method for playing the same. 4,277,065, Cl. 273-245.000.

Whitear, Brian R. D., to Ciba-Geigy AG. Magenta-masked color azopyrazolinone couplers. 4,277,398, Cl. 260-162.000.

Whitehead, Michael J.: *See*—
Garner, Robert; and Whitehead, Michael J., 4,277,400, Cl. 260-326.13B.

Whitlock, Ben H. Rifle baton. 4,276,807, Cl. 89-37.0BA.

Whittington, Lawrence E.: *See*—
Allison, Jean B.; Kudchadker, Mohan V.; and Whittington, Lawrence E., 4,277,352, Cl. 252-8.55D.
Kudchadker, Mohan V.; Kalfoglou, George; and Whittington, Lawrence E., 4,276,933, Cl. 166-266.000.

Wicklund, Peter A.; and Ivers, John T., to Frito-Lay, Inc. Process of making potato chips. 4,277,510, Cl. 426-441.000.

Wiechert, Rudolf: *See*—
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Steinbeck, Hermann, 4,277,468, Cl. 424-243.000.

Wieland, Dieter; and Meinert, Hartnut. Apparatus for determining the carbon dioxide content of a liquid, especially a beverage. 4,276,769, Cl. 73-19.000.

Wiesmann, Thomas W.: *See*—
Schotz, Larry A.; and Wiesmann, Thomas W., 4,277,785, Cl. 340-753.000.

Wilber, James A.; and Yorkanis, Bernard J., to RCA Corporation. Amplifier having dead zone of controllable width and position. 4,277,695, Cl. 307-542.000.

Wiley, Frederick R. Combined load cover and unloader. 4,277,220, Cl. 414-539.000.

Wilhelm, Keith A.: *See*—
Mershon, Butler A.; and Wilhelm, Keith A., 4,276,762, Cl. 72-13.000.

Williams, Roy C.; and Rogemoser, David R., to Textron, Inc. Water-dispersible urethane polymers and aqueous polymer dispersions. 4,277,380, Cl. 260-18.0TN.

Williams, Thomas A.; and Cussons, Frank M., to Albright & Wilson Limited. Process for purifying phosphoric acid. 4,277,455, Cl. 423-321.00S.

Williams, Thomas W.: *See*—
Brown, David J.; Walther, Ronald G.; Williams, Thomas W.; and Wrigglesworth, Michael D., 4,277,699, Cl. 307-272.00R.

Williams, W. Ray: *See*—
Saunders, Robert C.; Au, Dean T.; Williams, W. Ray; and Zurek, Donald, 4,277,831, Cl. 364-481.000.

Wills, Henry K.: *See*—
Kutnyak, Thomas A.; Koerber, Marvin A.; and Wills, Henry K., 4,277,640, Cl. 174-47.000.

Wilmer, Eugene A.: *See*—
Kaminski, Stanley; Mansolillo, Robert D.; and Wilmer, Eugene A., 4,277,427, Cl. 264-45.500.

Wilson, Harold R.: *See*—
Haworth, Richard G.; Wilson, Harold R.; and Tillmann, Ditmar K., 4,277,123, Cl. 339-22.00R.

Wilson, Max K.: *See*—
Piper, George F.; Vesperman, William C.; and Wilson, Max K., 4,277,642, Cl. 174-117.00F.

Wilson Trailer Company: *See*—
Lewis, Mack A., 4,277,096, Cl. 296-24.00C.

Winans, Esther D.: *See*—
Brois, Stanley J.; Ryer, Jack; and Winans, Esther D., 4,277,354, Cl. 252-51.50R.
Deen, Harold E.; O'Halloran, Rosemary; Winans, Esther D.; Ryer, Jack; and Brois, Stanley J., 4,277,353, Cl. 252-51.50R.

Winkler, Wolfgang: *See*—
Dangschat, Rainer; Jeschke, Alfred; Leichtl, Helmut; and Winkler, Wolfgang, 4,277,797, Cl. 358-21.00R.

Winsford Products, Inc.: *See*—
Morewood, William H., 4,277,213, Cl. 414-9.000.

Winthaegen, Leon M. W.: *See*—
van Boven, Petrus L. M.; and Winthaegen, Leon M. W., 4,277,166, Cl. 355-67.000.

Wirtz, Arthur T. Method and apparatus for truing a metal wheel, especially of a railroad locomotive or other rolling stock. 4,276,793, Cl. 82-1.00C.

Wisconsin Alumni Research Foundation: *See*—
Madsen, Ernest L.; Zagzebski, James A.; Banjavic, Richard A.; and Burlew, Michele M., 4,277,367, Cl. 252-408.000.

Wise, William F.; and Snyder, Jesse E., Jr., to Schramm, Inc. Water treatment discharge means. 4,277,341, Cl. 210-602.000.

Wiseman, Jeffrey S.: *See*—
Bey, Philippe; Metcalf, Brian W.; and Wiseman, Jeffrey S., 4,277,395, Cl. 260-112.50R.

Witmer, Theodore B., to Bickley Manufacturing Company. Sorting apparatus. 4,276,983, Cl. 209-587.000.

Wittmann, Heinz: *See*—
Himmetsberger, Alois; and Wittmann, Heinz, 4,277,083, Cl. 280-618.000.

Wodok, Hans: *See*—
Schrott, Werner G.; and Wodok, Hans, 4,277,135, Cl. 350-96.210.

Woinowski, Willis E., to Vesta, Inc. Method for extruding catheter tubing. 4,277,432, Cl. 264-173.000.

Wolters, Ernst: *See*—
Burg, Karlheinz; Schmieder, Werner; and Wolters, Ernst, 4,277,577, Cl. 525-154.000.

Woltersdorf, Otto W.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. 3-Amino-5-substituted-6-halo-N-(3,4-dihydro-6-substituted-1,3,5-truazin-2-yl)2-pyrazinecarboxamides. 4,277,602, Cl. 544-207.000.

Wolvek, Sidney; and Hanson, Bruce L., to Datascope Corp. Elongatable balloon catheter. 4,276,874, Cl. 128-1.00D.

Wong, Thomas Y., to General Electric Company. Fluid flow control system. 4,277,832, Cl. 364-510.000.

Woodman, Trevor P. Paint composition for the spectrally selective coating of metal surfaces, method of producing coatings therewith and an article produced thereby. 4,277,537, Cl. 428-409.000.

World Medical Marketing Corporation: *See*—
Hofstein, Steven R., 4,276,887, Cl. 128-691.000.

Worthington, Paul A.; Rathmell, William G.; and Skidmore, Anthony M., to Imperial Chemical Industries Limited. Heterocyclic triazole compounds, processes for their preparation, pesticidal compositions containing them, and methods of combating pests. 4,277,469, Cl. 424-245.000.

Wouda, Hermanus A. J., to D.E.J. International Research Company B.V. Process for extracting ground roasted coffee. 4,277,509, Cl. 426-387.000.

Wrigglesworth, Michael D.: *See*—
Brown, David J.; Walther, Ronald G.; Williams, Thomas W.; and Wrigglesworth, Michael D., 4,277,699, Cl. 307-272.00R.

Wright, Douglas C.; and Roberts, Sidney N., to Inheed Pty. Ltd. Spiral separators. 4,277,330, Cl. 209-459.000.

Wuertz, Kenneth L.: *See*—
Silver, Alexander; and Wuertz, Kenneth L., 4,277,707, Cl. 310-104.000.

Wuerzer, Bruno: *See*—
Eicken, Karl; and Wuerzer, Bruno, 4,277,278, Cl. 71-92.000.

Wunderer, Armin: *See*—
Hesky, Hans; and Wunderer, Armin, 4,277,256, Cl. 55-66.000.

WWG Industries, Inc.: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,276,740, Cl. 57-205.000.

Xerox Corporation: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,277,762, Cl. 331-94.50H.

Yabumoto, Toshiaki: *See*—
Fujiwara, Kunihiko; Osawa, Kazuya; Takeda, Yoshiteru; and Yabumoto, Toshiaki, 4,277,572, Cl. 525-61.000.

Yahl, Kenneth R., to CPC International Inc. Extraction of oil from vegetable materials. 4,277,411, Cl. 260-412.400.

Yajima, Toshio: *See*—
Kikuchi, Shoji; Yajima, Toshio; Kishi, Kenichi; Sasaki, Takashi; Mori, Keiichi; and Sato, Haruhiko, 4,277,558, Cl. 430-542.000.

Yamabe, Masaaki: *See*—
Oda, Yoshio; Yamabe, Masaaki; and Kato, Masao, 4,277,565, Cl. 521-31.000.
Ukihashi, Hiroshi; Yamabe, Masaaki; and Kojima, Hiroaki, 4,277,586, Cl. 526-93.000.

Yamada Co., Ltd.: *See*—
Yamada, Junji, 4,276,666, Cl. 5-481.000.

Yamada, Junji, to Yamada Co., Ltd. Mattress. 4,276,666, Cl. 5-481.000.

Yamada, Takashi: *See*—
Sekiya, Fukuo; and Yamada, Takashi, 4,277,840, Cl. 368-71.000.

Yamada, Tsuneo: *See*—
Wada, Takeshi; Ieraka, Masanori; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,277,703, Cl. 307-553.000.

Yamada, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic printer. 4,277,160, Cl. 355-3.00R.

Yamaguchi, Tetsuo; and Kashiwara, Tomokazu, to Sumitomo Rubber Industries, Ltd. Cushioning fender. 4,277,055, Cl. 267-140.000.

Yamaha Hatsukoki Kabushiki Kaisha: *See*—
Matsumoto, Hiromitsu, 4,276,862, Cl. 123-432.000.

Yamakyu Automatics Co., Ltd.: *See*—
Oizumi, Yoshio, 4,276,980, Cl. 198-851.000.

Yamamoto, Masahiko; and Nishino, Yoshinori, to Hitachi Shipbuilding & Engineering Company Limited. Cask bagging device. 4,277,688, Cl. 250-506.000.

Yamamoto, Takaharu: *See*—
Tobioka, Masaaki; Kodama, Mitsuo; Asai, Tsuyoshi; and Yamamoto, Takaharu, 4,277,283, Cl. 75-238.000.

Yamamoto, Takashi: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.

Yamamoto, Takeshi: *See*—
Kumazawa, Toshihiko; Yamamoto, Takeshi; and Odanaka, Hiroshi, 4,277,632, Cl. 568-867.000.

Yamamoto, Tatsuo: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.

Yamanaka, Minoru; and Tamura, Tooru, to Aisin Seiki Kabushiki Kaisha. Compound valve device. 4,276,746, Cl. 60-290.000.

Yamanobe, Kouji: *See*—
Kasahara, Nobuo; and Yamanobe, Kouji, 4,277,162, Cl. 355-14.00R.

Yanaka, Mikiro: *See*—
Enomoto, Satoru; Wada, Hisayuki; Nishita, Sadao; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,277,633, Cl. 568-879.000.

Yano, Takashi: *See*—
Ikesue, Masumi; Yano, Takashi; Tatsumi, Susumu; Idenawa, Hiroyuki; Nakamura, Isao; and Tani, Tatsuo, 4,277,163, Cl. 355-14.00R.

Yantovsky, Semen A.: *See*—
Klimenko, Alexandr S.; Emelyanov, Igor V.; Krylov, Anatoly A.; and Yantovsky, Semen A., 4,276,938, Cl. 169-47.000.

Yasuda, Eturo; and Ohta, Minoru, to Nippon Soken, Inc. Gas component detector. 4,277,439, Cl. 422-94.000.

Yates, Robert E.; Leonard, John P.; Alongi, Robert E.; Albanes, Wilfredo V.; and Bishop, Charles M., to United States of America, Army. Trajectory shaping of anti-armor missiles via tri-mode guidance. 4,277,038, Cl. 244-3.150.

Yavnieli, Mordechai: *See*—
Zeldov, Meir; and Yavnieli, Mordechai, 4,276,712, Cl. 43-112.000.

Yerusavage, Joseph A. Pedal actuated musical chord system. 4,276,801, Cl. 84-1.010.

Yiournas, Costas, to Vineland Laboratories, Inc. Automatic injection apparatus. 4,276,879, Cl. 128-218.00A.

Yokokawa, Sumio: *See*—
Nakagaki, Shintaro; Takanashi, Itsuo; Motoyama, Koichiro; Miyoshi, Tadayoshi; Yokokawa, Sumio; and Miyazaki, Kenichi, 4,277,800, Cl. 358-44.000.

Yoneda, Rikizo. Pressing device for a hose coupler. 4,276,765, Cl. 72-402.000.

York, Norman N. Attachment for firearms. 4,276,808, Cl. 89-136.000.

Yorkanis, Bernard J.: *See*—
Wilber, James A.; and Yorkanis, Bernard J., 4,277,695, Cl. 307-542.000.

Yoshibayashi, Shigeru: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Noguchi, Kenzo; and Kishikawa, Shinobu, 4,276,782, Cl. 73-650.000.

Yoshida, Hajime, to Hajime Industries, Ltd. Defect inspection system. 4,277,802, Cl. 358-106.000.

Yoshimoto, Takeo; Igarashi, Keiichi; Oda, Kengo; Ura, Masaaki; and Sato, Naoki, to Mitsui Toatsu Chemicals, Inc. Process for preparing diphenyl ethers. 4,277,624, Cl. 568-44.000.

Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, to Asahi-Dow Limited. Composition for drawn film, cold drawn film made of said composition and process for manufacture of said film. 4,277,578, Cl. 525-211.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Nozawa, Takamitsu, 4,277,001, Cl. 222-321.000.
Tsukada, Takami; Akutsu, Masao; and Saito, Tadao, 4,276,986, Cl. 215-1.00C.

Yoshino, Tsutomu: *See*—
Asada, Touru; Miura, Yasuhisa; and Yoshino, Tsutomu, 4,277,622, Cl. 564-512.000.

Young, Roger W.: *See*—
Landskroener, Peter A.; Dusenbery, John F.; and Young, Roger W., 4,277,010, Cl. 226-95.000.

Young, Victor. Plug device for drainpipe of basin or bathtub. 4,276,662, Cl. 4-295.000.

Yunker, Michael P.; and Barclay, David K. Aquaculture pond and harvester. 4,276,710, Cl. 43-4.000.

Yurcik, Raymond H., Jr.: *See*—
Hittel, Lorenz A.; and Yurcik, Raymond H., Jr., 4,277,732, Cl. 318-696.000.

Zabik, Alexander J.; and Fisher, Stephen G., to Medrex Ltd. X-ray microfilm reader. 4,277,153, Cl. 353-27.00R.

Zagzebski, James A.: *See*—
Madsen, Ernest L.; Zagzebski, James A.; Banjavic, Richard A.; and Burlew, Michele M., 4,277,367, Cl. 252-408.000.

Zahn, Markus: *See*—
Grimes, Patrick G.; and Zahn, Markus, 4,277,317, Cl. 204-1.00R.

Zahner, Hans; Drautz, Hannelore; and Keller, Walter, to Ciba-Geigy Corporation. Antibiotic and use thereof. 4,277,478, Cl. 424-258.000.

Zander, Werner: *See*—
Gref, Hans; Hofmann, Hans; Zander, Werner; and Busch, Josef, 4,276,853, Cl. 118-643.000.

Zanetta, Hugues, to Creusot-Loire; and Sprunck, Emile. Multiflow refining blastpipes for equipping converters for refining. 4,277,054, Cl. 266-268.000.

Zawodny, Arthur, to Keystone Camera Corporation. Camera. 4,277,158, Cl. 354-197.000.

Zbriger, Michael J.; and Passamenti, Anthony, to Aurora Products Canada, Ltd. Periodically swerving toy vehicle. 4,276,717, Cl. 46-262.000.

Zdansky, Ewald, to Hoval Interliz AG. Deposit filtering apparatus for filtering turbid liquids. 4,277,337, Cl. 210-173.000.

Zeldov, Meir; and Yavnieli, Mordechai, to Amcor, Ltd. Insect electrocution apparatus. 4,276,712, Cl. 43-112.000.

Zeltner, Erich, to Von ROLL AG. method for processing sewage sludge. 4,276,835, Cl. 110-342.000.

Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Programmed valve system used for positioning control. 4,276,810, Cl. 91-449.000.

Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Closed center programmed valve system with load sense. 4,276,811, Cl. 91-449.000.

Ziegler, Bodo: *See*—
Muller, Klaus; Maurer, Helmut; Linder, Ernst; Rieger, Franz; and Ziegler, Bodo, 4,277,323, Cl. 204-195.00S.

Zijlstra, Kornelis N., to Shell Oil Company. Deviation device. 4,276,942, Cl. 175-21.000.

Zilian, Dietrich: *See*—
Stahlecker, Fritz; and Zilian, Dietrich, 4,276,741, Cl. 57-263.000.

Zill, Karl: *See*—
Ruber, Klaus; and Zill, Karl, 4,276,682, Cl. 28-289.000.

Zimmerman, Dennis M.; and Robey, Roger L., to Eli Lilly and Company. Method of preparing 4a-arylhexahydro-1H-2-pyrindines and 4a-aryloctahydroisoquinolines. 4,277,608, Cl. 546-339.000.

Zimont, Leonard J.: *See*—
Sato, Kunito; Miller, Alfred F.; and Zimont, Leonard J., 4,277,508, Cl. 426-266.000.

Zinnai, Sadazi, to Tokyo Koso Kabushiki Kaisha. Metallic sealing device for valve. 4,277,047, Cl. 251-362.000.

Zochbauer, Heinz: *See*—
Czepel, Hubert; Jilek, Franz; and Zochbauer, Heinz, 4,277,532, Cl. 428-244.000.

Zurek, Donald: *See*—
Saunders, Robert C.; Au, Dean T.; Williams, W. Ray; and Zurek, Donald, 4,277,831, Cl. 364-481.000.

zur Nieden, Achim: *See*—
Streicher, Kurt; and zur Nieden, Achim, 4,276,859, Cl. 123-196.00R.

Zysman, Alexandre: *See*—
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,277,581, Cl. 525-420.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF JULY, 1981

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Altenheiner, Erwin; Donn, Volker; Hornschu, Joachim; Jachan, Walter; and Jung, Artur, to Carl Zeiss-Stiftung. Binocular telescope. Re. 30,665, Cl. 350-76.000.

Applied Science Research Institute: *See*—
Watanabe, Nobuatsu; and Kita, Yasushi, Re. 30,667, Cl. 252-1.000.

Buonomo, Franco; Fattore, Vittorio; and Notari, Bruno, to Snamprogetti, S.p.A. Process for preparing materials having improved mechanical and thermal properties and materials obtained thereby. Re. 30,668, Cl. 252-455.00R.

Carl Zeiss-Stiftung: *See*—
Altenheiner, Erwin; Donn, Volker; Hornschu, Joachim; Jachan, Walter; and Jung, Artur, Re. 30,665, Cl. 350-76.000.

Day, Edward J.: *See*—
Mitchell, James A. H.; and Day, Edward J., Re. 30,666, Cl. 434-307.000.

Donn, Volker: *See*—
Altenheiner, Erwin; Donn, Volker; Hornschu, Joachim; Jachan, Walter; and Jung, Artur, Re. 30,665, Cl. 350-76.000.

Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, to Toray Industries, Inc. Dry planographic printing plate. Re. 30,670, Cl. 430-281.000.

Fattore, Vittorio: *See*—
Buonomo, Franco; Fattore, Vittorio; and Notari, Bruno, Re. 30,668, Cl. 252-455.00R.

Feldman, Louis, to Gist-Brocades N.V. Microbial rennin. Re. 30,669, Cl. 426-36.000.

Gist-Brocades N.V.: *See*—
Feldman, Louis, Re. 30,669, Cl. 426-36.000.

Hornschu, Joachim: *See*—
Altenheiner, Erwin; Donn, Volker; Hornschu, Joachim; Jachan, Walter; and Jung, Artur, Re. 30,665, Cl. 350-76.000.

Jachan, Walter: *See*—
Altenheiner, Erwin; Donn, Volker; Hornschu, Joachim; Jachan, Walter; and Jung, Artur, Re. 30,665, Cl. 350-76.000.

Jung, Artur: *See*—
Altenheiner, Erwin; Donn, Volker; Hornschu, Joachim; Jachan, Walter; and Jung, Artur, Re. 30,665, Cl. 350-76.000.

Kita, Yasushi: *See*—
Watanabe, Nobuatsu; and Kita, Yasushi, Re. 30,667, Cl. 252-1.000.

Kobayashi, Masaharu: *See*—
Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, Re. 30,670, Cl. 430-281.000.

Kubota, Takashi: *See*—
Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, Re. 30,670, Cl. 430-281.000.

McKee, Donald S.: *See*—
Upton, Albert E.; and McKee, Donald S., Re. 30,664, Cl. 160-66.000.

Mitchell Beazley Encyclopedias, Ltd.: *See*—
Mitchell, James A. H.; and Day, Edward J., Re. 30,666, Cl. 434-307.000.

Mitchell, James A. H.; and Day, Edward J., to Mitchell Beazley Encyclopedias, Ltd. Audio visual information system. Re. 30,666, Cl. 434-307.000.

Notari, Bruno: *See*—
Buonomo, Franco; Fattore, Vittorio; and Notari, Bruno, Re. 30,668, Cl. 252-455.00R.

Poland, Sydney W., to Texas Instruments Incorporated. Microprocessor system having high order capability. Re. 30,671, Cl. 364-706.000.

Scott & Fetzer Company, The: *See*—
Upton, Albert E.; and McKee, Donald S., Re. 30,664, Cl. 160-66.000.

Shimokawa, Yoichi: *See*—
Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, Re. 30,670, Cl. 430-281.000.

Snamprogetti, S.p.A.: *See*—
Buonomo, Franco; Fattore, Vittorio; and Notari, Bruno, Re. 30,668, Cl. 252-455.00R.

Texas Instruments Incorporated: *See*—
Poland, Sydney W., Re. 30,671, Cl. 364-706.000.

Toray Industries, Inc.: *See*—
Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, Re. 30,670, Cl. 430-281.000.

Upton, Albert E.; and McKee, Donald S., to Scott & Fetzer Company, The. Retractable awning. Re. 30,664, Cl. 160-66.000.

Watanabe, Nobuatsu; and Kita, Yasushi, to Watanabe, Nobuatsu; and Applied Science Research Institute. Poly-dicarbon monofluoride. Re. 30,667, Cl. 252-1.000.

LIST OF DESIGN PATENTEES

Adamson, Gerald J.: *See*—
Lucas, Harry W.; and Adamson, Gerald J., 259,760, Cl. D7-77.000.

Airfix Plastics Limited: *See*—
Williams, Christopher, 259,759, Cl. D7-47.000.

Albinson, Don C., to Collier-Keyworth Company. Furniture base. 259,756, 7-7-81, Cl. D6-196.000.

Allibert Exploitation Societe Anonyme: *See*—
Cornou, Jean, 259,819, Cl. D99-44.000.

AMF Incorporated: *See*—
Davidson, William G., 259,780, Cl. D12-158.000.

Banasiak, Joseph G., Jr., to North American Philips Corporation. Packaging container or similar article. 259,768, 7-7-81, Cl. D9-414.000.

Beavis, Graham. Plastic crate. 259,818, 7-7-81, Cl. D99-44.000.

Bond, Robert L. Cart. 259,779, 7-7-81, Cl. D12-29.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Hentschel, Harry, 259,790, Cl. D15-112.000.

Brentham, Jerry D. Forearm exerciser. 259,799, 7-7-81, Cl. D21-195.000.

Buhk, Randall P., to Steelcase Inc. High back open arm chair. 259,750, 7-7-81, Cl. D6-31.000.

Capella, Inc.: *See*—
Ergaver, Rayko; and Ergaver, Nevenka, 259,815, Cl. D28-35.000.

Carre, Alain, to Waterman S.A. Ball-point pen. 259,793, 7-7-81, Cl. D19-51.000.

Clairol Incorporated: *See*—
Sledge, Larry C., 259,816, Cl. D28-35.000.

Coffin, Dennie L. Water ski-float. 259,803, 7-7-81, Cl. D21-228.000.

Coleman Company, Inc., The: *See*—
Lucas, Harry W.; and Adamson, Gerald J., 259,760, Cl. D7-77.000.

Collier-Keyworth Company: *See*—
Albinson, Don C., 259,756, Cl. D6-196.000.

Concept Engineering, Inc.: *See*—
Geschwender, Robert C., 259,752, Cl. D6-37.000.

Contico International, Inc.: *See*—
Dickinson, Thomas, 259,763, Cl. D7-194.000.

Cornou, Jean, to Allibert Exploitation Societe Anonyme. Tray. 259,819, 7-7-81, Cl. D99-44.000.

Countess York, Ltd.: *See*—
York, Alen S.; and York, Judd M., 259,745, Cl. D2-29.000.

Creative Playgrounds Corporation: *See*—
Dieter, Berthold B.; and Gibson, Charles L., 259,804, Cl. D21-245.000.

Criscitiello, Frank T., Jr. Plant container. 259,774, 7-7-81, Cl. D11-143.000.

Dahlgard, Karen L., to Standard Knitting Company. Sweater or similar article. 259,746, 7-7-81, Cl. D2-44.000.

Dallaire, Raymond. Window component extrusion. 259,810, 7-7-81, Cl. D25-74.000.

Davidson, William G., to AMF Incorporated. Motorcycle luggage carrier. 259,780, 7-7-81, Cl. D12-158.000.

Davis, Charles M., Jr. Machine for sorting and separating aluminum cans. 259,791, 7-7-81, Cl. D15-147.000.

Dickinson, Thomas, to Contico International, Inc. Waste receptacle. 259,763, 7-7-81, Cl. D7-194.000.

Dieter, Berthold B.; and Gibson, Charles L., to Creative Playgrounds Corporation. Playhouse climber. 259,804, 7-7-81, Cl. D21-245.000.

Downing, James R. Heliport floodlight. 259,813, 7-7-81, Cl. D26-24.000.

Eaton Corporation: *See*—
Williams, Jeffrey M., 259,802, Cl. D21-222.000.

Ehrreich, John E., to Ercon Corporation. Self-watering plant tray. 259,777, 7-7-81, Cl. D11-155.000.

Ercon Corporation: *See*—
Ehrreich, John E., 259,777, Cl. D11-155.000.

Ergaver, Nevenka: *See*—
Ergaver, Rayko; and Ergaver, Nevenka, 259,815, Cl. D28-35.000.
Ergaver, Rayko; and Ergaver, Nevenka, to Capella, Inc. Hair styler. 259,815, 7-7-81, Cl. D28-35.000.
Fleischmann, Gary A.; and Peabody, Lawrence C., to Kohler Co. Towel bar. 259,753, 7-7-81, Cl. D6-99.000.
Fleischmann, Gary A.; and Peabody, Lawrence C., to Kohler Co. Towel ring. 259,754, 7-7-81, Cl. D6-99.000.
Florists' Transworld Delivery Association: *See*—
Johnson, Donald K., 259,775, Cl. D11-148.000.
Waterfield, Martin J., 259,776, Cl. D11-153.000.
Fouhy, Richard J. Motorcycle hub lock. 259,764, 7-7-81, Cl. D8-331.000.
Fujimoto, Munenori: *See*—
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, 259,785, Cl. D14-5.000.
Furukawa, Masaaki; Onozaki, Noboru; Kondoh, Hideo; and Nishibayashi, Michiko, to Hitachi, Ltd. Video tape recorder. 259,784, 7-7-81, Cl. D14-02.000.
Gearhart, Le Mar M., II. Ball paddle or similar article. 259,800, 7-7-81, Cl. D21-213.000.
Geschwender, Robert C., to Concept Engineering, Inc. Leisure chair. 259,752, 7-7-81, Cl. D6-37.000.
Gibson, Charles L.: *See*—
Dieter, Berthold B.; and Gibson, Charles L., 259,804, Cl. D21-245.000.
Glaspec Corporation: *See*—
Smith, Warren D., 259,812, Cl. D25-80.000.
Guy, Richard. Extruded molding. 259,811, 7-7-81, Cl. D25-74.000.
Halls, David K. Stove. 259,808, 7-7-81, Cl. D23-97.000.
Harada, Toshio: *See*—
Yamamura, Masamichi; Harada, Toshio; and Takahashi, Hanji, 259,761, Cl. D7-128.000.
Hartung, Philip F. Bottle. 259,766, 7-7-81, Cl. D9-370.000.
Henkels, Walter. Combined desk set, pen holder and thermometer. 259,794, 7-7-81, Cl. D19-75.000.
Hentschel, Harry, to Bosch-Siemens Hausgerate GmbH. Beverage machine. 259,790, 7-7-81, Cl. D15-112.000.
Hitachi, Ltd.: *See*—
Furukawa, Masaaki; Onozaki, Noboru; Kondoh, Hideo; and Nishibayashi, Michiko, 259,784, Cl. D14-02.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,782, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,783, Cl. D13-99.000.
Holmes, Huntly S. Boat anchor. 259,781, 7-7-81, Cl. D12-215.000.
Hoshino, Kunio: *See*—
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, 259,785, Cl. D14-5.000.
Housman, Richard W. Combined vending cabinet and coin tray. 259,755, 7-7-81, Cl. D6-172.000.
Hudik, John: *See*—
Northrop, George S.; Hudik, John; and Schneider, Richard F., 259,769, Cl. D9-455.000.
Huntington, Donald. Bicycle safety flag. 259,772, 7-7-81, Cl. D10-109.000.
Ichikawa Press Industries Co., Ltd.: *See*—
Yabata, Hisao, 259,814, Cl. D26-28.000.
Igo, Toshio: *See*—
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, 259,785, Cl. D14-5.000.
Interdica, S.A.: *See*—
Perrin, Alain D., 259,757, Cl. D7-15.000.
Iseda, Takeshi: *See*—
Koga, Keisaku; and Iseda, Takeshi, 259,807, Cl. D23-2.000.
Itoh, Kunio; and Oka, Shigeo, to Pentel Kabushiki Kaisha. Marking pen or similar article. 259,792, 7-7-81, Cl. D19-51.000.
Jack Daniel Distillery, Lem Motlow, Prop., Inc.: *See*—
Redmond, Jobie G., 259,751, Cl. D6-32.000.
Johnson, Donald K., to Florists' Transworld Delivery Association. Planter. 259,775, 7-7-81, Cl. D11-148.000.
Kemper, Diane J. L. Plate hanger. 259,765, 7-7-81, Cl. D8-355.000.
Kimura, Kihachiro. Slug for a shotgun. 259,806, 7-7-81, Cl. D22-10.000.
Koga, Keisaku; and Iseda, Takeshi, to Sekisui Koji Kabushiki Kaisha. Storage tank for liquids or the like. 259,807, 7-7-81, Cl. D23-2.000.
Kohler Co.: *See*—
Fleischmann, Gary A.; and Peabody, Lawrence C., 259,753, Cl. D6-99.000.
Fleischmann, Gary A.; and Peabody, Lawrence C., 259,754, Cl. D6-99.000.
Kondoh, Hideo: *See*—
Furukawa, Masaaki; Onozaki, Noboru; Kondoh, Hideo; and Nishibayashi, Michiko, 259,784, Cl. D14-02.000.
Kosaka, Hideki: *See*—
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,782, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,783, Cl. D13-99.000.
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Combined tape recorder and radio receiver. 259,785, 7-7-81, Cl. D14-5.000.
Lancellotti, Joseph J.; and Schwartz, Michel S. Transparent cover for a medical disinfectant housing or similar article. 259,809, 7-7-81, Cl. D24-29.000.
Leeson, Fred D.; Main, Henry A.; and Read, Clifford D., to Northern Telecom Limited. Conferencing telephone unit. 259,786, 7-7-81, Cl. D14-57.000.
Leutz, Robert E. Flexible holder for a dial test indicator. 259,770, 7-7-81, Cl. D10-74.000.
Longo, Angelo S., to Selchow & Righter Company. Electronic word game housing. 259,795, 7-7-81, Cl. D21-13.000.
Lucas, Harry W.; and Adamson, Gerald J., to Coleman Company, Inc., The. Cooler. 259,760, 7-7-81, Cl. D7-77.000.
MacFarlane, George W. Fuel container. 259,767, 7-7-81, Cl. D9-374.000.
MacLean, Charles A. Horseman figure. 259,778, 7-7-81, Cl. D11-159.000.
Main, Henry A.: *See*—
Leeson, Fred D.; Main, Henry A.; and Read, Clifford D., 259,786, Cl. D14-57.000.
Marquardt, Jo Anne. Coaster set. 259,758, 7-7-81, Cl. D7-45.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, 259,785, Cl. D14-5.000.
Miyanaga, Setsuo; and Mishiro, Benito, 259,788, Cl. D14-73.000.
Yamamura, Masamichi; Harada, Toshio; and Takahashi, Hanji, 259,761, Cl. D7-128.000.
McDonald, Terry W. Traveler's multi-pocketed folded pouch or the like. 259,749, 7-7-81, Cl. D3-58.000.
Merchant, Gloria. Toy dump truck. 259,797, 7-7-81, Cl. D21-134.000.
Merchant, Gloria. Combined toy tractor, flatbed and logs therefore. 259,798, 7-7-81, Cl. D21-135.000.
Meyer, Milton. Game spinner. 259,796, 7-7-81, Cl. D21-22.000.
Mishiro, Benito: *See*—
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, 259,785, Cl. D14-5.000.
Miyanaga, Setsuo; and Mishiro, Benito, 259,788, Cl. D14-73.000.
Miyanaga, Setsuo; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Clock radio. 259,788, 7-7-81, Cl. D14-73.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, to Hitachi, Ltd. Semiconductor. 259,782, 7-7-81, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, to Hitachi, Ltd. Semiconductor. 259,783, 7-7-81, Cl. D13-99.000.
Motorola, Inc.: *See*—
Nagele, Albert L., 259,787, Cl. D14-68.000.
Murakami, Gen: *See*—
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,782, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,783, Cl. D13-99.000.
Nagele, Albert L., to Motorola, Inc. Vehicular two-way radio or similar article. 259,787, 7-7-81, Cl. D14-68.000.
Nishibayashi, Michiko: *See*—
Furukawa, Masaaki; Onozaki, Noboru; Kondoh, Hideo; and Nishibayashi, Michiko, 259,784, Cl. D14-02.000.
North American Philips Corporation: *See*—
Banasiak, Joseph G., Jr., 259,768, Cl. D9-414.000.
Northern Telecom Limited: *See*—
Leeson, Fred D.; Main, Henry A.; and Read, Clifford D., 259,786, Cl. D14-57.000.
Northrop, George S.; Hudik, John; and Schneider, Richard F., to Tri-Molded Plastics Inc. Combined cover and base for a squeeze tube or the like. 259,769, 7-7-81, Cl. D9-455.000.
Ohta, Kikuo: *See*—
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, 259,785, Cl. D14-5.000.
Oka, Shigeo: *See*—
Itoh, Kunio; and Oka, Shigeo, 259,792, Cl. D19-51.000.
Onozaki, Noboru: *See*—
Furukawa, Masaaki; Onozaki, Noboru; Kondoh, Hideo; and Nishibayashi, Michiko, 259,784, Cl. D14-02.000.
Otsuki, Keizo: *See*—
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,782, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,783, Cl. D13-99.000.
Outcalt, Miller. Photographic filter case. 259,748, 7-7-81, Cl. D3-33.000.
Peabody, Lawrence C.: *See*—
Fleischmann, Gary A.; and Peabody, Lawrence C., 259,753, Cl. D6-99.000.
Fleischmann, Gary A.; and Peabody, Lawrence C., 259,754, Cl. D6-99.000.
Pentel Kabushiki Kaisha: *See*—
Itoh, Kunio; and Oka, Shigeo, 259,792, Cl. D19-51.000.
Perrin, Alain D., to Interdica, S.A. Beverage cup. 259,757, 7-7-81, Cl. D7-15.000.
Persson, Herman. Climbing stand. 259,805, 7-7-81, Cl. D21-245.000.

Read, Clifford D.: *See*—
Leeson, Fred D.; Main, Henry A.; and Read, Clifford D., 259,786, Cl. D14-57.000.
Redmond, Jobie G., to Jack Daniel Distillery, Lem Motlow, Prop , Inc. Bar stool. 259,751, 7-7-81, Cl. D6-32.000.
Sabin, Christopher E. Trivet. 259,762, 7-7-81, Cl. D7-130.000.
Schneider, Richard F.: *See*—
Northrop, George S.; Hudik, John; and Schneider, Richard F., 259,769, Cl. D9-455.000.
Schwartz, Michel S.: *See*—
Lancellotti, Joseph J.; and Schwartz, Michel S., 259,809, Cl. D24-29.000.
Sekisui Koji Kabushiki Kaisha: *See*—
Koga, Keisaku; and Iseda, Takeshi, 259,807, Cl. D23-2.000.
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Longo, Angelo S., 259,795, Cl. D21-13.000.
Silvanov, Beverley. Sandal. 259,747, 7-7-81, Cl. D2-270.000.
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Dahlgard, Karen L., 259.746, Cl. D2-44.000.
Steelcase Inc.: *See*—
Buhk, Randall P., 259,750, Cl. D6-31.000.
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Takenaka, Kazumasa: *See*—
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, 259,785, Cl. D14-5.000.
Tri-Molded Plastics Inc.: *See*—
Northrop, George S.; Hudik, John; and Schneider, Richard F., 259,769, Cl. D9-455.000.
Usami, Satoru: *See*—
Kushida, Keizo; Igo, Toshio; Fujimoto, Munenori; Hoshino, Kunio; Usami, Satoru; Takenaka, Kazumasa; Ohta, Kikuo; and Mishiro, Benito, 259,785, Cl. D14-5.000.
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Carre, Alain, 259,793, Cl. D19-51.000.
White, Willard C. Dust respirator. 259,817, 7-7-81, Cl. D29-8.000.
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York, Alen S.; and York, Judd M., 259,745, Cl. D2-29.000.

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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

422 4,276,657

CLASS 3

1.5 4,276,658
1.9 4,276,659
1.91 4,276,660

CLASS 4

295 4,276,662
313 4,276,663
491 4,276,661
4,276,664

CLASS 5

184 4,276,665
481 4,276,666
498 4,276,667

CLASS 8

128 A 4,277,242
183 4,277,243
410 4,277,244
532 4,277,245
4,277,246
557 4,277,247

CLASS 9

2 A 4,276,668
313 4,276,669
337 4,276,670

CLASS 12

142 T 4,276,671

CLASS 13

35 4,277,638

CLASS 15

22 R 4,276,672
49 C 4,276,673
182 4,276,674

CLASS 16

111 R 4,276,675
126 4,276,676

CLASS 19

102 4,276,677
106 R 4,276,678

CLASS 23

230 B 4,277,249
4,277,250
230 M 4,277,248
232 R 4,277,251
293 R 4,277,331
313 R 4,277,252
4,277,253

CLASS 24

205.16 R 4,276,679
4,276,680

CLASS 28

105 4,276,681
289 4,276,682

CLASS 29

25.42 4,276,683
227 4,276,684
252 4,276,685
270 4,276,686
407 4,276,687
571 4,276,688
596 4,276,689
602 R 4,276,690

CLASS 30

347 4,276,691
4,276,692
380 4,276,693

CLASS 33

126.7 R 4,276,694
141 E 4,276,695
169 C 4,276,697
169 R 4,276,696
174 L 4,276,698
179.5 R 4,276,699
4,276,700

CLASS 34

109 4,276,701

CLASS 40

121 4,276,703
159 4,276,704
579 4,276,705
607 4,276,706

CLASS 42

17 4,276,707
44 4,276,708
71 P 4,276,709

CLASS 43

4 4,276,710
17 4,276,711
112 4,276,712

CLASS 46

8 4,276,713
118 4,276,714
154 4,276,715
206 4,276,716
262 4,276,717

CLASS 47

1.5 4,276,718
4,276,719
39 4,276,720
58 4,276,721

CLASS 48

180 R 4,277,254

CLASS 51

225 4,276,722
238 S 4,276,723
266 4,276,724

CLASS 52

1 4,276,725
109 4,276,726
115 4,276,727
177 4,276,728
209 4,276,729
221 4,276,730
484 4,276,731
517 4,276,732
745 4,276,733

CLASS 53

77 4,276,734
212 4,276,735
399 4,276,736

CLASS 55

20 4,277,255
66 4,277,256
85 4,277,257
152 4,277,258
270 4,277,259
273 4,277,260
278 4,277,261
4,277,262
282 4,277,263
294 4,277,264
302 4,277,265
381 4,277,266
494 4,277,267

CLASS 56

12.8 4,276,737
130 4,276,738

CLASS 57

91 4,276,739
205 4,276,740
263 4,276,741
4,276,742

CLASS 60

39.14 R 4,276,743
39.16 R 4,276,744
276 4,276,745
290 4,276,746
618 4,276,747
641 D 4,276,748

CLASS 62

26 4,277,268
51 4,276,749
157 4,276,750
138 4,276,751
166 4,276,752
186 4,276,753
187 4,276,754
196 B 4,276,755
503 4,276,756

CLASS 63

1 R 4,276,757

CLASS 64

9 R 4,276,758
17 R 4,276,759

CLASS 65

2 4,277,269
3 A 4,277,270
4,277,271
4,277,272
19 4,277,273
29 4,277,274
43 4,277,275
106 4,277,276
134 4,277,277

CLASS 70

107 4,276,760
252 4,276,761

CLASS 71

92 4,277,278

CLASS 72

13 4,276,762
234 4,276,763
275 4,276,764
402 4,276,765

CLASS 73

1 R 4,276,766
7 4,276,767
17 A 4,276,768
19 4,276,769
35 4,276,770
49.8 4,276,771
204 4,276,773
290 B 4,276,774
346 4,276,775
363.7 4,276,776
626 4,276,779
643 4,276,780
647 4,276,781
650 4,276,782
862.62 4,276,772
864.43 4,276,778
864.81 4,276,777

CLASS 74

15.63 4,276,783
336 R 4,276,784
462 4,276,785
491 4,276,786
552 4,276,787

CLASS 75

53 4,277,282
58 4,277,279
68 R 4,277,280
93 R 4,277,281
238 4,277,283

CLASS 76

108 A 4,276,788

CLASS 81

3.36 4,276,789
62 4,276,791
111 4,276,790

CLASS 82

1 C 4,276,792
4,276,793
4,276,794

CLASS 83

42 4,276,795
167 4,276,796
308 4,276,797
430 4,276,798
473 4,276,799
863 4,276,800

CLASS 84

1.01 4,276,801
1.19 4,276,802
343 4,276,803
394 4,276,804
458 4,276,805

CLASS 89

37 BA 4,276,807
136 4,276,808

CLASS 91

417 R 4,276,809
449 4,276,810
4,276,811
467 4,276,812

CLASS 92

12 4,276,813
23 4,276,814

CLASS 98

4,276,816
38 E 4,276,817
40 B 4,276,818
115 LH 4,276,819

CLASS 99

334 4,276,820
339 4,276,821

CLASS 100

207 4,276,822
257 4,276,823

CLASS 101

18 4,276,824
45 4,276,825
123 4,276,826
212 4,276,827
291 4,276,828
426 4,276,829

CLASS 102

467 4,276,830

CLASS 104

93 4,276,831
292 4,276,832

CLASS 105

197 DB 4,276,833

CLASS 106

1.05 4,277,284
52 4,277,285
4,277,286
287.12 4,277,287
309 4,277,288

CLASS 110

237 4,276,834
342 4,276,835

CLASS 111

86 4,276,836

CLASS 112

152 4,276,837
221 4,276,838
227 4,276,839
315 4,276,840
317 4,276,841
322 4,276,842

CLASS 113

1 F 4,276,843

CLASS 114

39 4,276,844
42 4,276,845
52 4,276,846
65 R 4,276,847
91 4,276,848
125 4,276,849
230 4,276,850
313 4,276,851

CLASS 118

326 4,276,852
643 4,276,853
689 4,276,854
719 4,276,855

CLASS 122

387 4,276,856
448 R 4,276,857

CLASS 123

73 CC 4,276,858
196 R 4,276,859
415 4,276,860
425 4,276,861
432 4,276,862
481 4,276,863
544 4,276,864
569 4,276,865
571 4,276,866
590 4,276,867
602 4,276,868

CLASS 126

41 R 4,276,869
141 4,276,870
292 4,276,871
425 4,276,872
438 4,276,873

CLASS 128

1 D 4,276,874
89 R 4,276,875
200.14 4,276,876
200.27 4,276,877
218 A 4,276,879
218 PA 4,276,878
221 4,276,880
263 4,276,881
419 P 4,276,882
419 PT 4,276,883
510 4,276,884
660 4,276,885
681 4,276,886
691 4,276,887
706 4,276,888
761 4,276,889

CLASS 131

84 C 4,276,891
185 4,276,892
270 4,276,890

CLASS 132

83 R 4,276,893

CLASS 133

5 R 4,276,894

CLASS 134

3 4,277,289
10 4,277,290

CLASS 137

2 4,276,895
101 4,276,896
218 4,276,897
231 4,276,898
327 4,276,899
355.21 4,276,900
469 4,276,901
505.18 4,276,902
554 4,276,903
599 4,276,904
613 4,276,905
625.38 4,276,906
637.2 4,276,907

CLASS 138

125 4,276,908
167 4,276,909

CLASS 139

273 A 4,276,910
308 4,276,911
437 4,276,912

CLASS 141

1 4,276,913
92 4,276,914
98 4,276,915
206 4,276,916
387 4,276,917

CLASS 144

2 Z 4,276,918

CLASS 148

1.5 4,277,291
6.27 4,277,292
175 4,277,293

CLASS 156

102 4,277,294
117 4,277,295
128 R 4,277,296
161 4,277,297
199 4,277,298
242 4,277,299
244.14 4,277,300
446 4,277,301
466 4,277,302
616 R 4,277,303
643 4,277,304

CLASS 160

66 Re.30,664
206 4,276,919
345 4,276,920

CLASS 164

4 4,276,921
27 4,276,922
76 4,276,923
130 4,276,924

CLASS 165

12 4,276,925
39 4,276,926
70 4,276,927
82 4,276,928
145 4,276,929
172 4,276,930

CLASS 166

99 4,276,931
214 4,276,932
266 4,276,933
286 4,276,934
295 4,276,935
303 4,276,936
323 4,276,937

CLASS 169

47 4,276,938
60 4,276,939

CLASS 172

42 4,276,940

CLASS 173

117 4,276,941

CLASS 174

42 4,277,639
47 4,277,640
65 R 4,277,641
117 F 4,277,642

CLASS 175

21 4,276,942
40 4,276,943
102 4,276,944
209 4,276,945
228 4,276,946
321 4,276,947

CLASS 176

1 4,277,305
9 4,277,306
10 4,277,307
19 EC 4,277,308
37 4,277,309
50 4,277,310

CLASS 177

44 4,276,948
212 4,276,949

CLASS 179

1 PC 4,277,643
1 SC 4,277,645
1 SD 4,277,644
2 DP 4,277,646
6.3 R 4,277,647
7.1 R 4,277,648
18 B 4,277,649
84 VF 4,277,650
90 B 4,277,651
100 D 4,277,652
146 E 4,277,653
156 R 4,277,654
170 R 4,277,655

CLASS 180

7 P 4,276,950
165 4,276,951
294 4,276,952
328 4,276,953

CLASS 181

224 4,276,954

CLASS 182

33 4,276,955
128 4,276,956
130 4,276,957
135 4,276,958
150 4,276,959

CLASS 184

6.22 4,276,960

CLASS 187

9 E 4,276,961

CLASS 188

1 D 4,276,962
71.4 4,276,963
73.3 4,276,964
73.5 4,276,965
79.5 P 4,276,966
134 4,276,967
153 R 4,276,968
218 XL 4,276,969
296 4,276,970
322 4,276,971

CLASS 192

4 C 4,276,972
47 4,276,973
98 4,276,974

CLASS 193

10 4,276,975

CLASS 198

334 4,276,976
446 4,276,977
654 4,276,978
775 4,276,979
851 4,276,980
866 4,276,981

CLASS 200

47 4,277,656
61.21 4,277,657
61.54 4,277,658
61.62 4,277,659
86.5 4,277,660
157 4,277,661
242 4,277,662
283 4,277,663
293 4,277,664
314 4,277,665
328 4,277,666

CLASS 202

183 4,277,311
241 4,277,312

CLASS 203

32 4,277,313
50 4,277,314
51 4,277,315
99 4,277,316

CLASS 204

1 R 4,277,317
78 4,277,318
159.23 4,277,319
164 4,277,320
192 E 4,277,321
195 S 4,277,322
4,277,323

CLASS 206

439 4,276,982

CLASS 208

45 4,277,324
. 4,277,325
263 4,277,326
4,277,327

CLASS 209

169 4,277,328
212 4,277,329
459 4,277,330
587 4,276,983

CLASS 210

96.2 4,277,332
136 4,277,333
154 4,277,334
159 4,277,335
167 4,277,336
173 4,277,337
186 4,277,338
413 4,277,339
433.2 4,277,340
602 4,277,341
609 4,277,342
614 4,277,343
654 4,277,344
679 4,277,345
691 4,277,346
704 4,277,347
791 4,277,348
797 4,277,349

CLASS 211

81 4,276,984

CLASS 212

177 4,276,985

CLASS 215

1 C 4,276,986
4,276,987
254 4,276,988
270 4,276,989

CLASS 219

10.49 R 4,277,667
69 M 4,277,668
121 LK 4,277,669
492 4,277,670
494 4,277,671
497 4,277,672
528 4,277,673

CLASS 220

209 4,276,990
223 4,276,991
254 4,276,992
269 4,276,993
454 4,276,994

CLASS 221

15 4,276,995
87 4,276,996

CLASS 222

23 4,276,997
30 4,276,998
129.4 4,276,999
142.4 4,277,000
321 4,277,001
349 4,277,002
350 4,277,003
402.14 4,277,004

CLASS 223

37 4,277,005

CLASS 224

193 4,277,007
273 4,277,008
309 4,277,009

CLASS 226

95 4,277,010
199 4,277,011

CLASS 227

68 4,277,012

CLASS 228

136 4,277,013

CLASS 229

11 4,277,014
23 C 4,277,015
69 4,277,016

CLASS 233

25 4,277,017

CLASS 235

92 EA 4,277,674
92 MB 4,277,675
92 PD 4,277,676
109 4,277,677

CLASS 236

46 R 4,277,018
49 4,277,019

CLASS 237

1 R 4,277,020
56 4,277,021

CLASS 239

7 4,277,022
11 4,277,023
36 4,277,024
102 4,277,025
127 4,277,026
177 4,277,027
184 4,277,028
232 4,277,029
407 4,277,030
414 4,277,031

CLASS 242

56 R 4,277,032
67.3 R 4,277,033
4,277,034
85.9 4,277,035
107.4 A 4,277,036
4,277,037

CLASS 244

3.15 4,277,038
3.16 4,277,039
153 R 4,277,040
182 4,277,041

CLASS 248

309 R 4,277,042
503.1 4,277,043
571 4,277,044
599 4,277,045

CLASS 250

223 R 4,277,678
310 4,277,679
358 R 4,277,680
4,277,681
380 4,277,682
402 4,277,683
445 T 4,277,684
4,277,685
4,277,686
4,277,687
506 4,277,688
567 4,277,689

CLASS 251

312 4,277,046
362 4,277,047

CLASS 252

1 Re.30,667
8.55 D 4,277,351
4,277,352
8.8 4,277,350
51.5 R 4,277,353
4,277,354
62 4,277,355
62.59 4,277,356
70 4,277,357
92 4,277,358
181 4,277,359
182.1 4,277,360
301.1 W 4,277,362
4,277,363
4,277,364
373 4,277,365
392 4,277,366
408 4,277,367
4,277,368
415 4,277,369
429 B 4,277,370
4,277,371
4,277,372
437 4,277,373
446 4,277,374
455 R Re.30,668
4,277,375
4,277,376
522 R 4,277,377
546 4,277,378
608 4,277,379

CLASS 254

8 B 4,277,048
91 4,277,049
94 4,277,050
106 4,277,051
4,277,052
326 4,277,053

CLASS 260

18 TN 4,277,380
23.5 A 4,277,381
29.2 M 4,277,382
29.3 4,277,383
29.6 RB 4,277,384
29.6 RW 4,277,385
4,277,386
29.7H 4,277,387
33.4 R 4,277,388
37 EP 4,277,390
37 N 4,277,389
40 R 4,277,391
4,277,392
112.5 R 4,277,393
4,277,394
4,277,395
146 R 4,277,396
157 4,277,397
162 4,277,398
239.3 T 4,277,399
326.13 B 4,277,400
340.6 4,277,401
340.9 R 4,277,402
343.3 P 4,277,403
347.8 4,277,404
348.21 4,277,405
389 4,277,406
390 4,277,407
397.1 4,277,408
397.45 4,277,409
404 4,277,410
412.4 4,277,411
428.5 4,277,412
4,277,413
429 R 4,277,414
429.5 4,277,415
456 R 4,277,417
465.4 4,277,418
4,277,419
791 4,277,422

CLASS 261

34 R 4,277,423
41 D 4,277,424
98 4,277,425

CLASS 264

8 4,277,426
45.5 4,277,427
118 4,277,428
127 4,277,429
129 4,277,430
148 4,277,431
173 4,277,432
289.3 4,277,433
297 4,277,434
328.12 4,277,435
518 4,277,436

CLASS 266

268 4,277,054

CLASS 267

140 4,277,055
140.1 4,277,056

CLASS 270

58 4,277,057

CLASS 271

23 4,277,059
186 4,277,060
302 4,277,061

CLASS 272

126 4,277,062

CLASS 273

75 4,277,063
138 A 4,277,064
245 4,277,065
267 4,277,066
271 4,277,067
324 4,277,068
418 4,277,069

CLASS 277

65 4,277,072

CLASS 279

1 SJ 4,277,073
60 4,277,074

CLASS 280

47.36 4,277,075
112 A 4,277,076
236 4,277,077
269 4,277,078
411 R 4,277,079
473 4,277,080
502 4,277,081
605 4,277,082
618 4,277,083
629 4,277,084
660 4,277,085
709 4,277,086
718 4,277,087
804 4,277,088

CLASS 282

27 R 4,277,089

CLASS 283

47 4,277,090

CLASS 285

55 4,277,091
263 4,277,092

CLASS 290

53 4,277,690

CLASS 294

83 R 4,277,093
145 4,277,006

CLASS 296

1 C 4,277,094
24 B 4,277,095
24 C 4,277,096
37.16 4,277,097
100 4,277,098
146 4,277,099

CLASS 297

5 4,277,100
232 4,277,101
411 4,277,102
457 4,277,103

CLASS 299

37 4,277,104
64 4,277,105
79 4,277,106

CLASS 301

13 SM 4,277,107

CLASS 307

35 4,277,691
66 4,277,692
141 4,277,693
221 D 4,277,694
255 4,277,696
265 4,277,697
272 A 4,277,698
272 R 4,277,699
273 4,277,700
291 4,277,701
304 4,277,702
542 4,277,695
553 4,277,703

CLASS 308

4 A 4,277,108
8.2 4,277,109
4,277,110
9 4,277,111
4,277,112
4,277,113
20 4,277,114
26 4,277,115
188 4,277,116
199 4,277,117
238 4,277,118

CLASS 310

49 R 4,277,704
64 4,277,705
80 4,277,706
104 4,277,707
228 4,277,708
261 4,277,709
316 4,277,710
334 4,277,711
4,277,712

CLASS 312

208 4,277,119
320 4,277,120
4,277,121
330 R 4,277,122

CLASS 313

203 4,277,713
217 4,277,714
220 4,277,715
4,277,716
226 4,277,717
304 4,277,718
325 4,277,719
485 4,277,720

CLASS 315

5.38 4,277,721
31 R 4,277,722
39.77 4,277,723
57 4,277,724
73 4,277,725
98 4,277,726
155 4,277,727
307 4,277,728
398 4,277,729
408 4,277,730

CLASS 318

685 4,277,731
696 4,277,732
732 4,277,733
758 4,277,734
766 4,277,735
811 4,277,736

CLASS 320

2 4,277,737

CLASS 322

28 4,277,738

CLASS 323

313 4,277,739

CLASS 324

51 4,277,740
58.5 C 4,277,741
61 R 4,277,742
71 CP 4,277,743
72 4,277,744
4,277,745
4,277,746
78 D 4,277,747
83 D 4,277,748
126 4,277,749
201 4,277,750
254 4,277,751
399 4,277,752

CLASS 328

26 4,277,753
133 4,277,754

CLASS 330

128 4,277,755
261 4,277,756
300 4,277,757

CLASS 331

1 R 4,277,758
94.5 H 4,277,759
4,277,762
94.5 N 4,277,760
94.5 T 4,277,761
96 4,277,763

CLASS 333

24 C 4,277,764
99 S 4,277,765

CLASS 335

122 4,277,766
210 4,277,767
216 4,277,768
4,277,769

CLASS 336

60 4,277,770

CLASS 338

308 4,277,542

CLASS 339

22 R 4,277,123
99 R 4,277,124
113 R 4,277,125
186 M 4,277,126

CLASS 340

27 NA 4,277,771
52 F 4,277,772
59 4,277,773
146.3 AG 4,277,776
146.3 Q 4,277,774
4,277,775
147 MD 4,277,777
171 A 4,277,778
348 4,277,779
365 S 4,277,780
545 4,277,781
661 4,277,782
708 4,277,783
711 4,277,784
753 4,277,785
765 4,277,786

CLASS 343

100 SA 4,277,787
113 R 4,277,788
708 4,277,789

CLASS 346

75 4,277,790
140 R 4,277,791

CLASS 350

3.67 4,277,127
6.8 4,277,128
27 4,277,129
36 4,277,130
63 4,277,131
76 Re.30,665
83 4,277,132
90 4,277,133
96.20 4,277,134
96.21 4,277,135
125 4,277,136
162 R 4,277,138
162 SF 4,277,137
286 4,277,139
288 4,277,140
299 4,277,141
302 4,277,142
334 4,277,143
349 4,277,144
351 4,277,145
356 4,277,146
357 4,277,147
432 4,277,148
467 4,277,149

CLASS 351

13 4,277,150
41 4,277,151

CLASS 352

17 4,277,152

CLASS 353

27 R 4,277,153

CLASS 354

5 4,277,154
23 D 4,277,155
25 4,277,156
187 4,277,157
197 4,277,158
312 4,277,159

CLASS 355

3 FU 4,277,161
3 R 4,277,160
14 R 4,277,162
4,277,163
16 4,277,164
55 4,277,165
67 4,277,166

CLASS 356

5 4,277,167
138 4,277,168
152 4,277,169
4,277,170
153 4,277,171
244 4,277,172
350 4,277,173
372 4,277,174
378 4,277,175
394 4,277,176
431 4,277,177
4,277,178
433 4,277,179

CLASS 357

24 4,277,792
30 4,277,793
40 4,277,794

CLASS 358

8 4,277,795
4,277,796
21 R 4,277,797
33 4,277,798
44 4,277,799
4,277,800
55 4,277,801
106 4,277,802
4,277,803
108 4,277,804
286 4,277,805

CLASS 360

16 4,277,806
32 4,277,807
113 4,277,808
131 4,277,809
133 4,277,810

CLASS 361

101 4,277,811
119 4,277,812
173 4,277,813
283 4,277,814
383 4,277,815
384 4,277,816

CLASS 362

31 4,277,817
61 4,277,818
80 4,277,819
223 4,277,820
346 4,277,821
352 4,277,822
4,277,823

CLASS 363

49 4,277,824
87 4,277,825

CLASS 364

200 4,277,826
4,277,827
415 4,277,828
431 4,277,829
4,277,830
481 4,277,831
510 4,277,832
555 4,277,833
706 Re.30,671
724 4,277,834
900 4,277,835
4,277,836
4,277,837

CLASS 365

222 4,277,838

CLASS 366

7 4,277,180
69 4,277,181
89 4,277,182
98 4,277,183
150 4,277,184
213 4,277,185

CLASS 367

155 4,277,839

CLASS 368

71 4,277,840
78 4,277,841
282 4,277,842

CLASS 369

84 4,277,071
248 4,277,070

CLASS 370

84 4,277,843

CLASS 371

38 4,277,844

CLASS 400

120 4,277,186
248 4,277,187
257 4,277,188
320 4,277,189
582 4,277,190
4,277,191
671 4,277,192

CLASS 401

39 4,277,193
173 4,277,194
195 4,277,195

CLASS 403

3 4,277,196
104 4,277,197
231 4,277,198
317 4,277,199
408 4,277,200

CLASS 404

35 4,277,201

CLASS 405

169 4,277,202
264 4,277,203
288 4,277,204

CLASS 406

123 4,277,205

CLASS 407

3 4,277,206
15 4,277,207

CLASS 408

14 4,277,208
139 4,277,209

CLASS 409

191 4,277,210

CLASS 410

47 4,277,211
78 4,277,212

CLASS 411

41 4,276,806

CLASS 414

9 4,277,213
139 4,277,214
292 4,277,215
331 4,277,216
395 4,277,217
401 4,277,218
421 4,277,219
539 4,277,220

CLASS 415

160 4,277,221
177 4,277,222
199.1 4,277,223

CLASS 416

58 4,277,224
198 A 4,277,225

CLASS 417

38 4,277,226
63 4,277,227
273 4,277,228
454 4,277,229

CLASS 418

131 4,277,230

CLASS 422

61 4,277,437
80 4,277,438
94 4,277,439
100 4,277,440
105 4,277,441
119 4,277,442
120 4,277,361
122 4,277,443
191 4,277,444
259 4,277,445

CLASS 423

136 4,277,446
165 4,277,447
167 4,277,448
4,277,449
243 4,277,451
244 4,277,450
246 4,277,452
247 4,277,453
320 4,277,454
321 S 4,277,455
328 4,277,456
331 4,277,457
437 4,277,458
567 A 4,277,459

CLASS 424

1 4,277,460
44 4,277,461
93 4,277,462
128 4,277,463
177 4,277,464
178 4,277,465
180 4,277,466
217 4,277,467
243 4,277,468
245 4,277,469
246 4,277,470
248.4 4,277,471
248.5 4,277,472
248.54 4,277,473
248.57 4,277,474
250 4,277,475
4,277,476
251 4,277,477
258 4,277,478
4,277,479
4,277,480
261 4,277,481
263 4,277,482
4,277,483
267 4,277,484
272 4,277,485
273 R 4,277,486
4,277,487
4,277,488
274 4,277,489
282 4,277,490
285 4,277,491
304 4,277,492
4,277,493
305 4,277,494
309 4,277,495
4,277,496
316 4,277,497
320 4,277,498
322 4,277,499
324 4,277,500
330 4,277,501

CLASS 425

387.1 4,277,231
525 4,277,232
588 4,277,233

CLASS 426

20 4,277,502
36 Re.30,669
40 4,277,503
62 4,277,504
64 4,277,505
111 4,277,506
264 4,277,507
266 4,277,508
387 4,277,509
441 4,277,510
548 4,277,511
549 4,277,512
656 4,277,513

CLASS 427

1 4,277,514
76 4,277,515
81 4,277,516
96 4,277,517
4,277,518
129 4,277,519
220 4,277,520
236 4,277,521
292 4,277,522
294 4,277,523
362 4,277,524
387 4,277,525

CLASS 428

31 4,277,526
109 4,277,527
192 4,277,528
211 4,277,529
216 4,277,530
228 4,277,531
244 4,277,532
332 4,277,533
379 4,277,534
389 4,277,535
402 4,277,536
409 4,277,537
429 4,277,538
450 4,277,539
518 4,277,541
546 4,277,543
547 4,277,544
627 4,277,540

CLASS 429

48 4,277,545
59 4,277,546
251 4,277,547

CLASS 430

22 4,277,548
30 4,277,549
68 4,277,550
120 4,277,551
122 4,277,552
216 4,277,553
270 4,277,554
278 4,277,555
281 Re.30,670
393 4,277,556
446 4,277,557
542 4,277,558
549 4,277,559

CLASS 431

361 4,277,234

CLASS 432

18 4,277,235

CLASS 433

3 4,277,236
72 4,277,237
201 4,277,238

CLASS 434

47 4,276,702
115 4,277,239
307 Re.30,666

CLASS 435

7 4,277,560
14 4,277,561
17 4,277,562
99 4,277,563
242 4,277,564

CLASS 455

52 4,277,845
611 4,277,846

CLASS 474

110 4,277,240

CLASS 493

196 4,277,241
287 4,276,815
433 4,277,058

CLASS 518

703 4,277,416

CLASS 521

31 4,277,565
32 4,277,566
56 4,277,567
68 4,277,568
92 4,277,569
106 4,277,570
164 4,277,571

CLASS 525

61 4,277,572
85 4,277,573
86 4,277,574
89 4,277,575
123 4,277,576
154 4,277,577
211 4,277,578
344 4,277,579
383 4,277,580
420 4,277,581
421 4,277,582
423 4,277,583
437 4,277,584

CLASS 526

65 4,277,585
93 4,277,586
106 4,277,587
114 4,277,588
122 4,277,589
127 4,277,590
174 4,277,591
227 4,277,592
279 4,277,593
352 4,277,594

CLASS 528

26 4,277,595
106 4,277,596
199 4,277,597
4,277,598
4,277,599
204 4,277,600

CLASS 544

22 4,277,601
207 4,277,602
250 4,277,603

CLASS 546

44 4,277,604
74 4,277,605
157 4,277,606
179 4,277,607
339 4,277,608

CLASS 548

125 4,277,609

CLASS 556

446 4,277,610

CLASS 560

24 4,277,420
53 4,277,611
55 4,277,612
121 4,277,613
4,277,614
4,277,615
4,277,616
124 4,277,617
231 4,277,618

CLASS 562

465 4,277,619
609 4,277,620

CLASS 564

250 4,277,621
512 4,277,622

CLASS 568

26 4,277,623
44 4,277,624
341 4,277,625
438 4,277,626
454 4,277,627
749 4,277,628
779 4,277,629
801 4,277,630
817 4,277,631
867 4,277,632
879 4,277,633
902 4,277,634
916 4,277,635

CLASS 570

185 4,277,421

CLASS 585

14 4,277,636
828 4,277,637

CLASSIFICATION OF DESIGNS

D2— 29 259,745
44 259,746
270 259,747
D3— 33 259,748
58 259,749
D6— 31 259,750
32 259,751
37 259,752
99 259,753
259,754
172 259,755
196 259,756
D7— 15 259,757
45 259,758
47 259,759
77 259,760
128 259,761
130 259,762
194 259,763
D8— 331 259,764
355 259,765
D9— 370 259,766
374 259,767
414 259,768
455 259,769
D10— 74 259,770
106 259,771
109 259,772
D11— 141 259,773
143 259,774
148 259,775
153 259,776
155 259,777
159 259,778
D12— 29 259,779
158 259,780
215 259,781
D13— 99 259,782
259,783
D14— 5 259,785
02 259,764
57 259,786
68 259,787
73 259,788
96 259,789
D15— 112 259,790
147 259,791
D19— 51 259,792
259,793
75 259,794
D21— 13 259,795
22 259,796
134 259,797
135 259,798
195 259,799
213 259,800
217 259,801
222 259,802
228 259,803
245 259,804
259,805
D22— 10 259,806
D23— 2 259,807
97 259,808
D24— 29 259,809
D25— 74 259,810
259,811
80 259,812
D26— 24 259,813
28 259,814
D28— 35 259,815
259,816
D29— 8 259,817
D99— 44 259,818
259,819

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

71— 34 T100,805
267— 141.1 T100,801
285— 156 T100,802
292— 285 T100,803
355— 14 FU T100,804

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

6 : 4,276,892	4,277,007	4,277,806	4,277,773	18 : 4,276,689	4,277,098
01 : 4,277,038	4,277,015	4,277,809	13 : 4,276,721	4,276,861	4,277,316
4,277,045	4,277,041	4,277,822	4,276,740	4,276,983	4,277,642
4,277,294	4,277,046	4,277,842	4,276,870	4,277,033	4,277,815
4,277,424	4,277,107	08 : 4,276,872	4,277,011	4,277,078	25 : 4,276,697
4,277,447	4,277,125	4,277,790	4,277,026	4,277,116	4,276,702
04 : 4,276,663	4,277,126	4,277,844	4,277,029	4,277,211	4,276,709
4,276,743	4,277,136	09 : 4,276,717	4,277,042	4,277,351	4,276,723
4,276,852	4,277,177	4,276,722	4,277,197	4,277,368	4,276,744
4,276,999	4,277,190	4,276,734	4,277,237	4,277,431	4,276,754
4,277,508	4,277,200	4,276,925	4,277,281	4,277,471	4,276,779
4,277,698	4,277,203	4,276,928	4,277,646	4,277,492	4,276,825
4,277,732	4,277,210	4,277,043	4,277,740	4,277,495	4,277,020
4,277,824	4,277,220	4,277,052	4,277,789	4,277,501	4,277,022
4,277,831	4,277,227	4,277,103	15 : 4,276,710	4,277,597	4,277,172
06 : 4,276,684	4,277,236	4,277,118	16 : 4,276,711	4,277,598	4,277,184
4,276,691	4,277,249	4,277,154	4,277,215	4,277,599	4,277,259
4,276,692	4,277,260	4,277,161	4,277,454	4,277,600	4,277,301
4,276,695	4,277,306	4,277,270	17 : 4,276,665	4,277,608	4,277,333
4,276,704	4,277,320	4,277,271	4,276,687	4,277,691	4,277,338
4,276,705	4,277,336	4,277,297	4,276,690	4,277,695	4,277,406
4,276,706	4,277,355	4,277,365	4,276,753	4,277,719	4,277,407
4,276,725	4,277,416	4,277,403	4,276,786	4,277,726	4,277,441
4,276,730	4,277,437	4,277,404	4,276,826	4,277,738	4,277,463
4,276,733	4,277,448	4,277,435	4,276,833	4,277,757	4,277,534
4,276,748	4,277,475	4,277,555	4,276,843	4,277,772	4,277,541
4,276,752	4,277,486	4,277,569	4,276,860	4,277,830	4,277,574
4,276,760	4,277,500	4,277,673	4,276,952	4,277,839	4,277,711
4,276,762	4,277,503	4,277,684	4,276,982	19 : 4,276,703	4,277,712
4,276,774	4,277,517	4,277,760	4,276,985	4,276,814	4,277,714
4,276,785	4,277,518	10 : 4,277,372	4,276,993	4,276,896	4,277,716
4,276,798	4,277,540	4,277,593	4,277,030	4,277,096	4,277,742
4,276,844	4,277,547	12 : 4,276,751	4,277,035	4,277,198	4,277,745
4,276,849	4,277,548	4,276,791	4,277,040	4,277,635	4,277,747
4,276,850	4,277,562	4,276,801	4,277,089	20 : Re.30,664	4,277,751
4,276,855	4,277,604	4,276,816	4,277,181	4,276,728	26 : 4,276,660
4,276,884	4,277,650	4,276,851	4,277,199	4,277,100	4,276,669
4,276,885	4,277,653	4,276,864	4,277,267	21 : 4,276,718	4,276,670
4,276,886	4,277,655	4,276,957	4,277,292	4,276,719	4,276,694
4,276,889	4,277,692	4,277,039	4,277,308	4,276,888	4,276,708
4,276,890	4,277,694	4,277,067	4,277,364	4,277,059	4,276,724
4,276,897	4,277,697	4,277,075	4,277,370	4,277,188	4,276,755
4,276,902	4,277,702	4,277,076	4,277,411	4,277,217	4,276,757
4,276,917	4,277,707	4,277,080	4,277,428	22 : 4,276,776	4,276,783
4,276,934	4,277,718	4,277,095	4,277,504	4,276,931	4,276,799
4,276,944	4,277,728	4,277,131	4,277,506	4,277,104	4,276,812
4,276,953	4,277,736	4,277,134	4,277,511	4,277,243	4,276,867
4,276,954	4,277,739	4,277,139	4,277,564	4,277,373	4,276,951
4,276,958	4,277,762	4,277,148	4,277,662	24 : 4,276,817	4,276,966
4,276,967	4,277,763	4,277,224	4,277,710	4,276,895	4,276,974
4,276,975	4,277,768	4,277,423	4,277,727	4,276,915	4,277,009
4,276,992	4,277,771	4,277,484	4,277,833	4,276,943	4,277,012
4,277,006	4,277,782	4,277,764	4,277,841	4,277,017	4,277,037

4,277,066
4,277,084
4,277,087
4,277,092
4,277,117
4,277,123
4,277,137
4,277,147
4,277,219
4,277,222
4,277,331
4,277,332
4,277,339
4,277,520
4,277,521
4,277,526
4,277,611
4,277,612
4,277,613
4,277,614
4,277,615
4,277,616
4,277,619
4,277,637
4,277,741
4,277,814
4,277,819
27 : 4,276,658
4,276,713
4,276,795
4,276,882
4,276,883
4,276,914
4,276,948
4,277,002
4,277,014
4,277,018
4,277,049
4,277,214
4,277,226
4,277,254
4,277,344
4,277,551
4,277,656
4,277,681
4,277,693
4,277,826
28 : 4,276,681
29 : 4,276,869
4,276,901
4,276,994
4,277,008
4,277,420
30 : 4,276,836
4,277,462
31 : 4,277,023
4,277,027
4,277,028
4,277,069
32 : 4,277,651
33 : 4,277,034
4,277,189
34 : 4,276,688
4,276,770

4,276,780
4,276,800
4,276,841
4,276,879
4,276,887
4,276,923
4,276,924
4,276,984
4,276,991
4,277,000
4,277,004
4,277,010
4,277,024
4,277,063
4,277,064
4,277,158
4,277,170
4,277,173
4,277,213
4,277,232
4,277,248
4,277,261
4,277,262
4,277,284
4,277,298
4,277,300
4,277,317
4,277,321
4,277,326
4,277,327
4,277,353
4,277,379
4,277,381
4,277,391
4,277,392
4,277,401
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